

2003 GEORGIA BASIN/PUGET SOUND

RESEARCH CONFERENCE

Keynote Addresses and General Session Speeches

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Opening General Session
March 31, 2003

David Fraser
Conference co-chair, Environment Canada

Ladies and Gentlemen, colleagues, friends, my name is David Fraser. I represent Environment Canada, as a co-chair of this international event. On behalf of Dr. Pete Dowty, the Puget Sound Action Team, the Georgia Basin Ecosystem Initiative, and our 30 co-sponsors—Canadian and American—welcome to the 2003 Georgia Basin/Puget Sound Research Conference. We have four full days ahead of us, a full program. We have over 775 registrants, 300 presentations over the four days, ranging from marine environmental quality, marine stewardship, climate change, threats to habitat and species, transboundary airshed management, governance, decision support tools, and of course, oceanography, amongst many others. I encourage you to take advantage of the range of information that will be put forward over the next four days. Reach out beyond your regular realms, regular activities; take the broadest approach, the ecosystem approach. And please share your knowledge with our students that are here; share your knowledge and your information.

I'd like to take this opportunity to restate our conference themes, which are: **Applying Science and Information towards Sustainability in a Shared, Transboundary Ecosystem**. We share this ecosystem, we share common issues, and we share the problems. We offer you a venue to exchange your knowledge and your information, all towards common solutions and a future research agenda.

It is my pleasure to open this conference introducing **Chief Leah George Wilson** of the **Tsleil-Waututh Nation**, on whose territory we are fortunate enough to be gathered here today. Chief George Wilson...

▶Chief Leah George Wilson
Tsleil-Waututh Nation

Thank you. And I have with me my cousin brother Sitswano and we'd like to do a welcome song for you... *(Performance followed by applause)…* What I said to you in our original language called "down river halcamalum" was greetings to my elder relatives and our honored guests. We have good feelings in our hearts to see you today. In our Indian way I told you my ancestral name is "Sitsi Ama." I am the daughter of Earnest Indiana George, granddaughter of Lilia and Harrater Chief John L. George, welcoming you to Coast Salish Traditional Territory.

I'd like to take this moment to welcome you on behalf of our entire First Nation. We are really very excited and honored to be here with you today. As I said earlier, I have my cousin brother Gabriel Sitswano with us and his son Rob over on that end and his nephew Lance in the middle. We're honored to be here with you and share that song. That song was called the wolf song and in our language wolf is "takia" and that is our clan symbol so we're welcoming you to the land of the wolves, so to speak.

Just before we go we'd like to sing another song. It's the nature song, in special recognition of the event that's taking place and how important the environment is to not only "qualmoth," First Nations people but to "mestayoth," all of the people. Thanking all of you.

David Fraser

Thank you. I have the distinct pleasure of introducing our first keynote speaker of the morning: **Ms. Elizabeth Dowdeswell**. Ms. Dowdeswell served as Executive Director of the United Nations Environment Program and under Secretary General of the United Nations until 1998. Previously, she was the Assistant Deputy Minister with Environment Canada, responsible for the National Weather and Atmospheric Agency. Recently, Ms. Dowdeswell was appointed President and CEO of Canada's nuclear waste management organization. In addition to this new responsibility, during the last year she has contributed to an initiative for the JFK Center for Science and International Affairs at Harvard University, which focuses on how to mobilize the world's scientific and technical knowledge to solve global development challenges.

Her address this morning it titled: **"Science, Technology and Globalization: New directions for science in a changing world**." With that, please join me in welcoming, Ms. Elizabeth Dowdeswell.

▶ Elizabeth Dowdeswell

Last year the "in" publication *Fast Company* created the concept of an idea virus. The notion was that an idea that just sits there is worthless. An idea that moves, grows and infects everyone it touches—that's an idea virus. My hope for all of you is that this conference will be a place that incubates ideas for the service of humankind. You have the potential to design a better future and the capability to produce it.

Is that too grandiose an objective? In the early years of the 21st Century, post 9/11, there is much reflection. We are exposing mistakes and the unfinished business of the past, identifying stubborn global problems and inaction by the great powers. And many have come to realize that in our society there has been an arrogance of ignorance and a powerful momentum toward mediocrity.

When we look critically at the state of the world, our performance is simply not good enough. I won't recite the pessimistic reviews of the ecological fate of the earth, however compelling and mind-numbing the statistics might be. Two-thirds of humankind fall far short of having a decent quality of life. Population grows. We continue to dump toxics in our air, water and land.

Suffice it to say that on the environmental front, any assessment concludes that there is no room for complacency. Virtually every indicator from water shortages to air pollution shows symptoms of a world in very wobbly disequilibrium. A world in which the majority are poor and the minority are excessive consumers is simply not sustainable. And one could undertake a similar and compelling analysis in other areas of concern such as social justice.

At the same time our world is changing. This is a time of blurring sovereignty, blinding technological change, integrated economies, and growing alienation between political processes and peoples' passions.

We live in a world where ideas cross borders as if they did not exist, where cyberspace is beyond national control and where the speed and magnitude of capital flows is incredible. The horror of September 11 has surely illuminated the extent of our interconnectedness and the fragility of a world of inequity.

Slowly we are coming to understand that debts held by banks in New York affect the way timber is harvested in Brazil; subsidies paid to sugar beet farmers in France affect a farmer's ability to survive in Mauritius; chemicals used in Germany may play a role in giving cancer to a child in Australia.

But we understand less well how to avoid a collision between growing ecological pressures, significant challenges to social cohesion and economic expansion. A billion people living in dire poverty alongside a billion in splendour, in a world made smaller by cell phones and the internet is a recipe for social confrontation.

Ten years ago, world leaders embraced the concept of sustainable development. Bringing together environmental, economic and social considerations promised much improved decisions. It was the politics of hope. A concept so seductive. We were asked to imagine real improvements in the health of the environment, a more equitable sharing of the earth's resources and a much improved quality of life for more of the planet's people.

Last fall in Johannesburg, the world community met to assess progress over the past decade. I believe the report card found us wanting. The promise of Rio has not been fully realized. To be charitable, sustainable development remains a "work in progress". Compared to the scope of the change that is needed, we are largely tinkering in the margins. There is clearly a disconnect between what we negotiated and what we delivered.

So the conversation that we should be having is around the question: Why is action on the sustainable development agenda so elusive? Why are countries and companies not living up to what they have promised? Why is there a gap between policy and action? Why is the policy response so weak and hesitant? What do we need to do differently if we are to succeed on a grander scale?

In environmental terms we know what needs to be done. We know that we have to stabilize and possibly reduce population levels and to end the assault on the Earth's life-support system with our wastes and pollution and poisons. I'll go out on a limb and suggest that no environmental issue has yet emerged that is not within the capabilities of the human race to resolve. We have tremendous knowledge and technological capability. And we have very compelling evidence on most issues for the need to act.

I suspect that one of the answers to our lack of progress may be that not many gave thought to the real nature of sustainability. It is one of those words that is deceptively simple, but has many challenges in implementation.

For example:

- **It is intrinsically holistic and interdisciplinary**. (Did we remember that our existing institutional structures have at best a mixed track record on managing interdisciplinarity?)
- **It embodies complexity.** (Issues like the safety of biotechnology and climate change are genuinely complex issues, in every facet.)
- **It makes value judgments about equity.** (So it should not surprise us that national interests dominate and north/south tension is prevalent.)
- **It is very long-term in character, quite inconsistent with the time-frames of elected governments.** (We are finding that the politics of anticipate and prevent is much harder than of react and cure.)
- **What sustainability demands is a change in the way we behave—a change in our attitude toward the world.** And that is as true of institutions as individuals.

Through the lens of environment, we can see the challenges very clearly.

- Why is it that we can detect environmental contaminants at the level of parts per billion, but we are unable to unify the many fragmented pieces of policy and law in different jurisdictions?

- Why is it that we can reduce toxic emissions, in certain cases by 99 percent, but we cannot agree on the role that economics plays in setting standards?

- Why is it that scientists can design complex computer models to predict likely trends in global climate change, under many scenarios, while we have been singularly unsuccessful in making a convincing case to the public and in engaging them as a means of bringing about change?

I believe that a better understanding of the systemic nature of environmental problems would lead us to different management approaches.

We need to understand interdependence: linkages among various environmental issues; linkages between science and policy; linkages among people and their governments the world over. We all talk about these connections, yet hastily retreat into our well-defined and relatively safe cocoons of specialization and country.

Today, no less a scholar than Harvard's E.O.Wilson says, "The greatest enterprise of the mind always has been and always will be the attempt to link the sciences and the humanities. The ongoing fragmentation of knowledge and the resulting chaos in philosophy are not reflections of the real world, but artifacts of scholarship."

Almost all of the problems of our time are problems at new interfaces or that take place because of a lack of integration between related forces, both environmental and human. Yet we organize ourselves on a sectoral and hierarchical basis. The real search for solutions must be based on integrated, multidisciplinary science that reaches beyond into the

economic and social domains. We have to know what society wants, what risks we are prepared to accept and what collective measures we will commit to as global citizens.

In the past year a network of scientists has been spearheading thinking about a new field of scientific inquiry called sustainability science, which is attempting to respond to some core questions:

- How can dynamic interactions between nature and society be better incorporated in our models?
- How are long-term trends in environment and development, such as consumption and population, reshaping those interactions?
- What determines resilience and vulnerability?
- Can scientifically meaningful "limits" or "boundaries" be defined to warn us of risks?

They ask fundamental questions about the nature and purpose of science.

- Is science generating useful knowledge and know-how that society and its leaders want and need?
- Is it directed to the solution of sustainable development problems, not just their definition?
- Is the science place-based, supporting the agenda of local communities, helping them assess options?
- Does it empower people to make better decisions? Is it accessible to decision-makers?
- Does it encourage interdisciplinary understanding and sharpen our response to sectoral challenges?

Some would suggest that what we need is a new contract between science and society, linking research to policy and action and reconciling scientific excellence with social relevance.

Maybe this is nothing new. For years, haven't we all embraced the ecosystem approach? Perhaps so—at least on paper. But there is less evidence that we have actually been successful in practicing what we preach. So I can only applaud efforts to remind us about the imperative of thinking systemically (even if to some it is only a repackaging of some long-held concepts).

If we can learn valuable lessons from the study of ecosystems, the organization of patterns in nature, we may be able to build and nurture sustainable communities. From science comes an articulation of basic principles of interdependence, flexibility and diversity and, of course, remaining within boundary conditions, all of which are essential for sustainability. But to understand interdependence requires a shift in perception from the parts to the whole, from objects to relationships, to patterns. We need to balance dynamically stability and change, order and freedom, tradition and innovation.

Today this ecological approach is imperative. In fact, the various concepts already agreed to by the international community—the precautionary principle, common but differentiated responsibilities, intergenerational equity—to name just a few, are inherent in an ecological view.

But we're certainly not there yet. Perhaps climate change is the real test. It's not about meteorology, but about energy, economic development, security and our various ways of life. It is surely testing our skills in collective political will.

Our challenges will not be met with traditional entrenched modes of thinking. Fresh and innovative perceptions need to be brought to bear. Preventing a genomics divide or responding to profound inequities and questions of ethics call upon different skills and approaches. Issues like climate change require us to shift from the local and short-term focus to a focus that is regional and international in scope, to problems that are highly uncertain and not amenable to quick technological fixes. Agility and responsiveness need to be designed into our institutional structures just at the time when so many of them are going through a mid-life crisis. Innovation and technology development need to be encouraged, particularly to replace ecologically empty economic models, and best practices identified and replicated.

Science and technology are now widely recognized as a factor in the economic health of nations. Industrialized countries use them as a competitive tool to advance relative power in the global economy. Science and technology have been at the centre of negotiations of international legal regimes, informing the positions of countries and their interactions with industry and non-governmental organizations.

Although there has been a long-standing emphasis on management of risks posed by science and technology, more recently science and technology have been promoted as a tool for improving the human condition and addressing the needs of the poor. However, far too often technological revolutions (e.g., information and agricultural biotechnology) have created divides between industrialized and developing peoples.

For example, much of the research in genomics takes place in developed countries, where it primarily addresses the health needs of people in those countries. This reflects the notorious 10/90 gap whereby 90 percent of health research dollars are spent on diseases affecting 10 percent of the world's population.

The potential global significance of genomic and related biotechnologies will raise problematic issues about access to knowledge and predictable attempts to assert global influence over this emerging resource. These advances will bring new opportunities to solve global health problems—but they will at the same time test our skill in the management of international relations—a phenomenon some call "genome diplomacy." I would argue that science and technology are becoming important elements of foreign policy and international relations.

As evidence note the United Kingdom's white paper: *Excellence and Opportunity: a science and innovation policy for the 21st century*, which drew attention to the growing importance of the international dimension of science and technology work for wealth creation in the UK. Similarly in the United States, Secretary of State Colin Powell, in an address to the National Academy of Sciences, said that in issues ranging from creating conditions for sustainable development to stemming the global HIV/AIDS pandemic, the formulation of foreign policy must proceed from a solid scientific foundation.
The 2001 United Nations Development Program's Human Development Report*: Making New Technologies Work for Human Development* clearly documents the historical role of science and technology in human development.

The Canadian Program on Genomics and Global Health recently addressed the issue of how best to harness genomics and related biotechnologies to reduce global health inequities, highlighting some important applications in developing countries. Concerted actions are needed, however, to avoid a genomics divide in health. There is a need for research, capacity strengthening, consensus building, public engagement and investment.

Canadians should care about global inequities, and the opportunity to harness science, for both altruistic and self-interested reasons.

Global health inequities constitute one of the biggest ethical challenges facing the world today. Life expectancy in some developed countries such as Australia, Canada and Japan is approaching 80 years, while in seven sub-Saharan African countries it is 40 and dropping.

Globalization, especially in terms of free trade, has so far tended to increase economic disparities between developed and developing countries. Many have argued that these disparities contribute to international political tensions, and that addressing them by reducing poverty, increasing communication and giving voice to the powerless, will help to foster peace and understanding. Now, more than ever, we need to find common ground.

In a recent issue of *Science*, Kofi Annan, United Nations Secretary-General, issued a challenge to the world's scientists to bring the benefits of science to all. Not surprisingly he suggested that "if science is to reach its full potential and draw on the great minds from every country, we must do more to end and prevent conflict."

Canada has always been at the forefront of advocacy for the interests of developing countries. As Lester Pearson said, "There can be no peace, no security, nothing but ultimate disaster, when a few rich countries with a small minority of the world's people alone have access to the brave, and frightening, new world of technology, science, and of high material living standard, while the large majority live in deprivation and want, shut off from opportunities of full economic development; but with expectations and aspirations aroused beyond the hope of realizing them".

And that brings me back to those of you in this room. The challenges of alleviating poverty, reversing environmental degradation and shaping globalization require our best efforts. A future of more mouths to feed, uncertain environmental conditions and unmet development expectations should make us pause. Sustainable development remains largely theoretical for the majority of the world's people. But with your commitment and energy a sustainable planet is not an unreachable goal.

Jim Anderson

Executive Director of the North West Indian Fisheries Commission

Good morning, my name is Jim Anderson, I'm not Billy Frank….I am the Executive Director of the Northwest Indian Fisheries Commission, the Intertribal Organization of the Indian Tribes in Western Washington party to the United States versus Washington decision also known as the Boldt Decision. Our organization provides technical, legal, information and policy support to our member tribes as they manage their harvest, hatchery and habitat responsibility. Having said that, I'd like to recognize the tribes from Washington State that have allowed me to be here.

I'm here today to introduce Billy…I have had the distinct honor of shadowing Billy for the past 25 years, the past 20 years with the commission as executive director. Billy is a mentor to me, almost equal parts brother, uncle and father, and I've had a real learning experience working with him…as he has represented the tribes of western Washington, as well as the tribes around the country. Billy is quite simply our country's foremost Indian fish chief, and as former President Clinton said a number of years ago, Billy is a "force of nature."

Billy has received many honors, not the least of which is the Governor's Environmental Excellence Award, both for individual achievement and in a couple of partnership efforts: The Timber Fish Wildlife Agreement and the Chelan Water Agreement. He has received the national Common Cause Award, as well as the Albert Schweitzer Prize for Humanitarianism.

But Billy hasn't let these awards be a culmination of his distinguished life, he has continued to pursue his dream, his vision where salmon and their ecosystems can live and co-exist in harmony with humans and the human systems. He has continued as the chair of the fish commission, providing direction and leadership to the entire region as we struggle in Washington State with salmon recovery, the Endangered Species Act implications, the Clean Water Act, and other laws and regulations and processes. He's been a leader of state efforts, water quality, water resources, forestry, agriculture and other issues.

I know from my experience that Billy is one of a kind. He's not only the most consistent natural resources leader in the Northwest, but he's also a real human being. He loves people, he likes to hear from people and he has a unique ability to listen, absorb and translate those thoughts and interests. Today is an opportunity to hear from a guy who's fought the fight. Billy, as many of you know, was arrested over 70 times in his life, for civil disobedience, most of it civil disobedience (laughing) as he would fish until he got the federal government's attention that started litigation leading to the Boldt Decision.

Billy will share how he sees science and policy in advancing in tandem. He will talk, I think, of incremental change, of how we have to be positive. I think he'll reflect on the reality but also the need for determinism. He will speak from the heart and from the mind. He'll tell how the tribes want to proceed, their approach to science and research and also their spirit and willingness to partner with the non-Indian world. Despite all the tribes have endured, Billy will tell of promise and hope and concern for the human world.

Join me then in giving a hand to one of our generation's most unique, accomplished, and valuable guiding lights: Billy Frank.

▶Billy Frank Jr.

Nisqually Tribe and Northwest Indian Fisheries Commission

Now James drove me up here and I didn't realize he was writing all this time. Thank you James. Thank you, Elizabeth, for the good words about what we're facing in the world and… thanks to our singers this morning. Your opening this great day for all of us was beautiful.

As I get up in the morning I look out this time of the year and I think…Mother Nature's in balance, it's just us that are out of balance. You know—people. This time of year the whales are coming up from the south and they're heading to their grounds up in the north. And the spring salmon are out in the ocean right now, getting ready to come home to some of these rivers. And our culture, our way of life, is that we're going to have ceremonies to welcome these salmon coming back home, because the salmon has sustained us of all of our lives; our children, our grandpas and our grandmas and our

aunts and uncles. It sustained us through our spirit of life and…we can't live without it. We can't live without that energy that the salmon brings that flows through our blood and keeps us healthy.

The salmon has a long hard life to sustain itself now, but looking over the country before the people got here, the people forget that the salmon was here and sustained their life. As I grew up I always loved to see the farmers because they were very important. They seemed like they were well grounded, and they were. But they forgot about who sustained them here before their potatoes started growing they were out there getting salmon for their kids. Now today the same farmers won't come to the table to sustain the life of these salmon in either of these basins we have: The Georgia Basin and the Puget Sound Basin.

I live way down in the deep south Puget Sound, on the mouth of the Nisqually River. Mount Rainer is the source of the headwaters of our river. And we're doing a lot of good things down in that part of the country. You're doing a lot of great things up here, too, all of you. You know, both of these basins are so important to us in our life, in our quality of life, in our way of life. You look out here you got all kinds of boats, you got all kinds of airplanes flying in, landing out here, transporting people. Sometimes people forget about what the food chain is all about in this country, and how that cycle of the food is so important to every one of us.

We have a lot of fighting going on throughout our country now; we have lawsuits making lawyers very rich. You, as science people, are so important to what we're doing and what we're all about. Government—whether local government, state, province or federal—does not always take your advice or your recommendations, but you have to be there all the time pushing that envelope for clean water. This is true whether you're working down on the bays or the rivers, whether you're down in Baja California, or up in Alaska—wherever you may be.

These two basins that we have here are so important to our lives and the lives of all our visitors that come here. We're trying to make these watersheds healthy again. When you make them healthy you have salmon that are rotting up in the watersheds. When our children go up these watersheds they smell the salmon spoiling, no one teaches them that that's healthy, that they're feeding the animals up there and the nutrients are going down into the sea. No one makes them understand that this is very common. In our old days we always saw the eagles and the seagulls and all of the animals eating that rotten salmon; and that's a healthy watershed when that happens. I always talk to the little children about, you know, the important things in our lives, about going down to the rivers and going down to the mud, going down and getting wet, coming back and getting wet again. But always, always be out there and in the rain. Be out there talking and make your teachers take you to the watersheds, stick your hands into the mud, just be a child and be able to play out there at that watershed, or that trail, wherever they might be.

The science people are valuable throughout this whole Pacific Coast. They're valuable in our world, in our world that we don't have control of. But we do have control of our own back yards; we have control of the mouth of Nisqually River, our Nisqually tribe, and other tribes along every one of these watersheds, the Fraser here. We have control over what we do and how we act, how we carry ourselves, how we bring people into the circle to make that circle strong, and how we gather up more and more people into that circle to make that circle strong. It's very powerful when we can all talk to each other and listen to each other, and talk about what we're doing on the ocean or what we're doing up the river. Because all of that gives you energy; it makes you understand that there's other people doing things. We're not alone, none of us is alone. Elizabeth talked about the world, about how our setting out there is not very healthy. But when we get together and talk in these forums like this, we talk about not being alone, that we have things going on down there from Baja California up to Alaska, on the East Coast, down on the Southwest. All over our country and the Great Lakes, people are working, doing what they have to do to protect our environment.

In the state of Washington, I'm always trying to bring the natural resource to the front, and it's very hard to do because the salmon don't vote. This is what the round circle in Seattle talks about, Gary Locke, says, "hey, the salmon don't vote. To hell with the salmon, to hell with the shoreline management. To hell with the clean water." That is not the way to bring us together, and I see that. But that does not slow us down. The republicans come in, that don't slow us down. Who are they? They're the republicans, they're like the democrats, you know. Maybe there's a little sunshine they're going to give us, the natural resource people. And we're going to make hay with that.

Like these republicans right now, they've got the Ocean Commission. And I know a lot of these people that sit on that Ocean Commission; some of them are from the Northwest, republican people, good people. They've been working in the environment all their professional life. We'll make hay with those people, we'll be there to help them make a decision on the ocean, make their recommendations on these two basins that we're talking about here this week. We'll be here to work with the state and the local government that supports anybody and everybody. We have the salmon recovery team

that's working right now under Bill Ruckelshaus. We're making a lot of headway bringing a lot of people into that circle. We have 17 watersheds in Puget Sound and all but two are working real hard together right now, and we're bringing the other two in.

You know, these are positive things that are happening, but we can't ever quit doing that. This recovery team is only going in talking about 2004 and 2005. I don't even register that because I talk about lifetimes, I talk about a professional lifetime that you have to give to the natural resource world out here. It isn't just coming in today and leaving tomorrow. Or coming in for 10 years and leaving. Put a lifetime into this; these younger kids that we have here. I'm so happy to see them here. Put a lifetime into what we have to do to protect our environment; put a lifetime in how we have to work with the utility people; put a lifetime into how we got to keep these people growing trees. We don't want to get rid of them people, but make them do the right thing. Make them people put in stream flows in them rivers, you know, embarrass them if you have to. A lot of people will not enforce the laws that we have on the books, so we have to embarrass them. But any way we do it, we've got to make it happen. But if we can get them to sit down with us and talk to us, we can make it happen, you know. We can give them…give them incentives or whatever you might want to do. And maybe there's too many incentives out there. We got too many people on the welfare; now that isn't the poor people, poor people you know they deserve the welfare, they're starving to death!

But the farmers are on welfare, the business community in the state of Washington is on welfare. Millions of dollars is going to these people; billions of dollars is going to the farmers throughout the United States. Farmers right now are so damn rich they won't sit down with you! They don't have just the farm house now, when it floods down there they got another house up in the mountains. So who do we sit down with? Who do we make them people sit at that table and talk about sustainability? Sustaining their lives…we don't want the farmers to move, because if the farmer moves, the developer moves in and takes our watershed over. We have to keep working everyday at everything that we're talking about.

Right now in the state of Washington, we have a lawsuit going. Now in 1898 was the first hatchery that was put in on the Nooksack River, just across the border where the Lummi and Nooksack Tribes are. In 1898 the first hatchery went in, Jesus, that's a hell of a long time ago! The second hatchery in the 1900s was put in on my river, the Nisqually River in Muck Creek. Most people couldn't find this place on the map. Have you heard of it? The first hatcheries came a long time ago. And the hatchery programs were run wrong. They were run for individual political people, they were run for sportsmen or whoever. They were taking fish stocks from one place and moving them to another…they did everything wrong.

Today we have reform. After the Boldt Decision we started doing a whole lot of management. Tribes started their infrastructure and got it together with their professional people, and we're sitting there as managers. The legal foundation of the tribes now is really a foundation of co-management, in the Northwest. And that gives us a great opportunity to work with each other on things such as hatcheries. So we put hatchery reform together, but there is a lot of work left to do if we've got to reform these hatcheries, hundreds of hatcheries we have in the state of Washington. But now comes Washington Trout—puts a lawsuit against the hatcheries. And it…Washington Trout is some environmental people and some fishing people…we thought they were our friends and now they're…they're not our friends. They've got a lawsuit against, hatchery reform. Hatchery reform…it's going to take us 50 years to reform hatcheries—50 years to reform hatcheries! Them people won't even be around, you know, but we'll be here reforming hatcheries, make 'em better, make 'em better, make 'em better, everyday. And now they put a preliminary injunction…their second part of that lawsuit is a preliminary injunction to stop all hatcheries, and they're in federal court. Now these people should be working with us, all of us…we should be working together, but we're not. We're going in this direction (hands moving in a splitting apart motion). And we will not, the tribes will not stand by and watch anybody destroy our resources in front of us.

Now if hatcheries were gone today, there wouldn't be any more fish in these basins. That's the way reality is. That's what happened to our wild salmon…moving stocks and doing different crazy things over the last 150 years. And we won't stand by and allow that to happen. But then there's the other fights going with the other people. Greenpeace is out there in the ocean with our Makah people. The Makah people closed their whaling down for 70 years…70 years so the whales could come back. And then they went out…their treaty specifically says that they can whale. They're whaling people, they can whale. And now we're in the court saying they can't exercise that right. So now we have another battle on that front.

Indian tribes are easy targets for the environmental community out there. They make money by fighting Indians. Indians don't hide. Indians are there everyday along those rivers…they're fishing along these rivers. We've closed down now about 80 to 90 percent of our harvest from the sea right now, so we can start recovering the salmon. And we're fishermen…that's our life, we're fishermen. We teach our children how to fish; we teach our children how to hang the nets; we teach our children how to…how to maneuver out there in their canoes and their boats. And that's what it's all about.

Now the science people are doing a lot of things along the Pacific Coast and in these two basins. Some of the things that we're doing is that we're putting up things like the marine protected areas. And we like to see that…we like to see these marine protected areas. But you have to understand what the Indian tribes have set aside in their usual and accustomed fishing grounds. We cannot go out of that boundary. We can't go down the coast of Oregon, we can't go up into Canada, we can't go down into Puget Sound. A specific tribe only has a narrow bunch of usual and accustomed fishing areas. So if you put a restricted marine protected area in there and say that the tribes can't fish then we're gonna have to fight. So let's not get into these things, let's understand the tribes, let's understand each other. Talk to us, we'll talk to you. If you're over there on that part of the coast or along the Strait of Juan de Fuca, talk to us. There's tribes there. They have their professional people, they have their lawyers, they have their policy people, they have…all of their professional people are willing to sit down and understand one another and make it happen.

We need them protected areas. We need that forest under the sea that nobody ever sees. Nobody sees that there's a forest under this waterway out here…under both of these basins there is a big forest. You know it…you, the science people know we have to protect that. We have to keep that healthy and we have to bring it back before it's gone. And we'll do that…we'll do that over a 100 years maybe. There's some of these bays that are poisoned…Commencement Bay in Tacoma, Washington. Poisoned! You'll never bring it back… all of the money that the government's got will never bring that bay back. But nature will bring it back; the tides will clean it…the next 100 years it'll be clean, if we don't keep poisoning it again.

We went to Kamchatka Peninsula…after the communists got done. We have relations with those people, just like our relatives up here in Canada. But they ask us, the Kamchatka people, they ask us to come up there…so we all went up there with the city of Seattle and all of the good people, the churches and everybody. And them people came down for the World's Fair, that's why, and then they invited us, so, you know 20 years later we went up to see them. And people there are very poor…they took us down to the river where they caught salmon and fed us. They don't have a McDonalds, they don't have gravel on their road. They don't have no blacktop or anything. They're people that live off the land. And there's a lot of forgotten people.

But when we got in there like this, a big room, a lot of interpreters…they were so happy that they were going to have this American firm that was going to mine their gold on the Kamchatka Peninsula. And just like you out there, we're all sitting along with all of the people up there, and then the interpreter talked about who the American firm was. It was Asarco. Asarco is the firm that poisoned the city of Tacoma…Commencement Bay. We never went up there to bust Asarco's bubble, but when they mentioned that, everybody from the U.S….(makes a surprised facial expression)…dang! So the people wanted to know why did you make that face when we mentioned Asarco. So they had to tell 'em. And when we got home, Asarco from New York called and asked us about what was said up there and what we told them was you have a chance to do the right thing for them people up there. Not do the wrong thing like you did in Tacoma, Washington… Commencement Bay, but do the right thing.

Our world is very little now; it's very small. But how do we…how do we make them do the right thing, these corporations? How do we do it? We keep talking to them, we keep embarrassing them. And we're there, we're there to argue for the right way to do things and against the wrong way.

In 1985, 1985…not very long ago, the timber industry in the State of Washington decided to be regulated…they didn't have to be regulated, nobody would make them regulate. But some leaders sat down and said, we have to be regulated. Today the timber industry is regulated in the State of Washington, today the Forest Practice Board regulates the timber industry, and they work together. Not everything is rosy, but at least we have that forum and we can make things be better.

Trying to bring everybody into that fold is…is a job in it's own. And it's a lifetime job. One time my hair was black, like a lot of you, I met some of my friends in here and they were talking about 50-year-old birthdays. Well, they have spent a lifetime doing this, doing what we're doing…trying to get the word out, trying to write the papers right, trying to be honest, professional, personal, trying to get that information in front of somebody that's going to make a difference.

And as we move through life, we move through lawyers, we move through attorney generals, we move through… governors, legislators, we move through the United States Congress, or this government up here. They're only there for a little while…they're not there very long. Their politics come and go; they're in and they're out. They don't have a long-term plan like we do, like you. They're just passing through here, and they're trying to make their pitch right off the bat. So all of these governors that are passing through, they'll be gone…we'd like to have them on our side but if they're not, so what. We can't waste time on these people…we don't have time! There are too many things going on in our world now. We're over in Iraq, that's a big question mark. We're doing a whole lot of things in our country, in the U.S.A…a whole lot of things in Canada, in Alaska. It's all got question marks on it.

But this is a good time to be living…this is a great time to be alive because we can make a difference. You can make a difference, everyone of you…our kids can make a difference. And how you make a difference is being there and listening, taking part and talking…and to have the professional level right to the top. Never let anybody take you down the side road. When you make that report, you make it…you write it, you write well. Because I've read these reports and it makes me feel happy that there are people out there that are doing the right thing. And it makes me live another day, or another year.

Now, all I'm asking for is 30 more years. My dad lived to be 104, my mom lived to be 96, and I just told the surgeon that all I want is 30 more years because our job is not done yet. And after 30 years it won't be done either… but I'll be here. Thank you very much.

Pete Dowdy

Conference co-chair, Puget Sound Action Team

I'm Pete Dowdy, I'm from the Puget Sound Action Team, the other co-chair of this operation, and of course I'd like to thank Billy, and Elizabeth and Chief Leah for opening the conference for us. Thank you very much.

I'd like to introduce the closing speakers—they're in charge of this effort—**Joe Gaydos** and **Eric Karlsen**. They will be working throughout the conference, with the support of session chairs and some volunteers. They will be recording highlights of the sessions as they take place…in particular looking for what we have learned in these sessions, what future directions need attention and what barriers need to be removed in order to meet the challenges of sustainability in this shared system. Session chairs, we've asked you to write some notes from your session. We have session reporting forms and we have copies of those available for session chairs at the registration desk. f you can complete those and return those as soon as possible…we're very grateful for your efforts, this is a big help to us. This will ensure we have a concise record of the accomplishments, major challenges and the future directions and again we will hear about this in the closing session.

Also, I'd like to announce the Pacific Estuarine Research Society, which will be opening their annual meeting Thursday afternoon in a joint session with this conference. They will be continuing into Friday, and you can get more details from Brett Dumbauld or Jan Newton—they will be leading that PERS conference.

And lastly I wanted to thank the sponsors of the conference that have really made it possible to put this on. And also the advisory committee members, who put in a lot of time and effort helping us put together the program and making this conference happen. Thank you very much.

Morning Session
April 1, 2003

▶Brad Ack
Chair, Puget Sound Action Team

Good morning everyone, my name is Brad Ack and I am the new Chair of the Puget Sound Action Team. I was recently appointed to this position by Governor Gary Locke of Washington and it's a pleasure for me to be here this morning with all of you. And I'm really grateful to have the opportunity to interact with and learn from all the wonderful folks at this conference.

This is my third week on the job with the Puget Sound Action Team and I think the staff thought, "ok you're going to run the Action Team, let's see just how good you are when we put you in a position of action." Either that or it was an April Fool's joke; but I don't know the staff well enough yet to know their sense of humor so I'm still trying to figure that one out.

I come to the Puget Sound Region and this job directly from the dry, arid, scratchy highlands of the American South West, the Colorado Plateau. And that is not an April Fool's joke—it's true. The good news is in our household budget, we were able to save hundreds of dollars on this move in our sunscreen line item…we zeroed that out, had a big surplus, but now we've had to move it all into a new line item, Gore-Tex, which previously didn't appear in our household budget, so it's kind of a wash.

Just a little bit about myself. I've spent the last 15 years working on landscape-scale conservation throughout the Americas, Latin America, Mexico and North America. The last 10 I've been in the Colorado Plateau region, which is an area that's actually not dissimilar to the Puget Sound region in everything except the climate, of course. But from a conservation perspective, the similarities are numerous. The region covers four states, 31 counties, many municipalities. Thirteen tribes make their home on the Colorado Plateau; there is extensive land areas under Federal management; there is extensive state holdings, most of the most biologically productive lands are in private hands. In short, it's a very similar sort of jigsaw-puzzle jurisdictions that we have in the Puget Sound/Georgia Basin area. And I've worked throughout Latin America as well, and I'm not a stranger to complex conservation challenges and intense conflicts over conservation and natural resources. Of course in this region the icon species, or one of the icon species, is the orca and in the Southwest, where I came from, it was the humpbacked chub, which, its kind of like the beauty and the beast of the natural world; and we have beauty up here.

On behalf of the Puget Sound Action Team I'm really pleased to add my welcome and thanks to all of you. The incredible turnout here and the energy that started yesterday morning at the kick off of this conference, I think, bode very well for the future of this region. The breadth and depth of the research being presented here is fabulous; it mirrors the wonderful diversity of this region, and the fact that we're holding this conference in Canada in cooperation with Environment Canada and the Georgia Basin Ecosystem Initiative is great news also for the region. Clearly, many of the problems that we have to address are transboundary in nature, and international cooperation and collaboration is going to be absolutely critical to the long-term health of the resources, and to the success of our collective efforts.

In my time this morning I just want to make a few key points. I want to introduce the Puget Sound Action Team a little more fully so that people know who we are. I want to talk about the role of science in addressing some of the problems of the Georgia Basin/Puget Sound Region, and then I'd like to speak a little bit about some of the priorities that we in the Action Team see in the Basin and how we might organize ourselves to continue to have success in addressing those.

So first, what is the Puget Sound Action Team? It was established in Washington State Statute in 1986 in recognition of the incredible environmental, economic and cultural importance of the Puget Sound Region. Its core mission is to coordinate the diverse and myriad efforts of the state, through its numerous agencies, to protect and restore Puget Sound, with a focus on water quality. The Action Team is really a partnership, I hope…and…expect, of state and federal agencies along with representatives of cities and counties and tribes, the private sector, who meet and plan together on a shared conservation agenda for the Puget Sound. We have an Advisory Council with diverse interests that help advise the Action Team, and we have a professional staff that works in coordination and collaboration with the staffs of the various

agencies on this agenda for conservation. One way to think about this Action Team is really as the state's partnership and focal point for Puget Sound conservation and restoration. We're the entity that is required by law and mandate to keep our eyes on the overall system, and our work is really to integrate and catalyze and align all the actions of the different people who are involved in protecting and restoring the Puget Sound. We're also the federally recognized entity that leads conservation efforts in this estuary of national significance. It was designated by the United States Environmental Protection Agency in 1988 as part of the National Estuary Program.

Let me just briefly talk about a few of the things that the Action Team agencies and partners have accomplished since we've been started. We've been tracking the vital signs of the Puget Sound region and reporting on its health almost since inception, looking at and coordinating measurement in trends of water quality and habitat, biological resources around the Sound. We've reported—published three times—the key environmental indicators of the Puget Sounds health and we've done five previous research conferences that brought together groups like this to talk about the latest findings and scientific events related to Puget Sound issues. Stormwater has been a focus of the Action Team for quite some time, and working with local governments around the Basin we've made a great deal of progress in developing stormwater management plans for many of the municipalities and…jurisdictions. Restoring shell fish beds has…long been an area of concerted action by state and local agencies trying to identify and stop pollution sources that…harm shellfish beds, and we've been successful in reopening a number of shellfish growing areas and now the focus has really turned to preventing future declines and downgrades.

Washington was the first state to adopt standards for sediment quality and there has been a great deal of emphasis on cleaning up contaminated sediments. Between '87 and 2001… a lot of effort has been focused here and right now. The Sound is home to 112 sediment clean-up sites. Preventing sewage pollution from homes and boats has been a big emphasis of the Action Team Agencies staff, getting state law in place to ensure that onsite sewage systems are designed and installed properly. We have a wonderful team of what we call local liaisons who are out in the region that are working with local governments and private interests to directly manage the resources, and they're kind of the interface between the Action Team and local governments.

We've spent a lot of time focused on the nearshore environment, and we're part of the broad coalition to restore and protect some of the 2,500 miles of shoreline in the Puget Sound. Oil spill prevention has been a big focus and the Department of Ecology, a member of the Action Team, has been leading efforts to station a permanent rescue tug in the bay to prevent and respond oil spills, and since 1999, that tug has successfully responded to about 19 vessels in distress. And the Action Team has always spent a great deal of effort and involvement on engaging people in conservation. Over the years the Action Team has funded over 300 projects and educated and involved the public in taking action, direct action, to enhance the Puget Sound and provided nearly 6 million dollars in funding for those projects.

Those are some of the successes and positive movements of the Action Team. They're not all of them by any means. We've done a great deal together, and there's a great deal more for us to do.

Now let me talk a little bit about the role of science in addressing these conservation and restoration challenges we face. I think we all agree that good science is absolutely critical in solving the complex problems that we're discussing here regarding restoration and preservation of the Puget Sound. We have to understand the complex dynamics of these systems in order to understand why change is happening and especially where we can best focus on our increasingly limited resources in order to make change happen and get the biggest possible change for our resources. We clearly need interdisciplinary science and science that integrates knowledge and findings across various fields of inquiry and specialization. And we have to recognize that science is never going to provide all the information we need in order to make decisions. We can not wait for perfect or even near perfect information, and as managers and policy makers, we really need to build and maintain and nurture a productive partnership with the science community so that we have the best information at the time that we have to make decisions.

Conservation in this complex and dynamic system has to be about adaptive management. We want to work with the scientific community to take your best science and apply it incrementally using the concepts of adaptive management. We need your involvement in translating your best science into policy and programs. And I recognize that there is a great deal of a lot of uncertainty, and there always will be a great deal of uncertainty about key conservation challenges and issues in these shared waters. And there is risk associated with that uncertainty; there's no doubt about it. But I argue that there's far greater risk in not acting. We simply can not afford to wait.

Finally, we have to recognize that while science may often have an answer, it's only one piece of the answer. And science, as difficult as it is, is sometimes the least difficult aspect of the conservation equation. There aren't any easy ones, there's

just more difficult and least difficult. We have to make sure that we add the sociology, the economics and the politics of conservation and restoration issues to the science in order to get the answer that's going to start to work for us and be sustainable. There's a tremendous need for you as scientists to be at this larger table directly and to really roll up your sleeves and play in this messy and unscientific environment of policy and program development. We need you to actively participate as full partners, hopefully even leaders, along with the other key players who are going to be needed to make good conservation happen. And I know for some…I know from my experience that for some scientists this can be pretty uncomfortable, but I think it's a moral and ethical imperative.

Now let me turn to some of the key priorities that we see in the Basin, and if you'll humor me I'm going to use an analogy, I hope it won't be offensive to anybody, of a medical emergency. Let's think of the Puget Sound region as a person who's been abusing their health for a long time, doing all the wrong things, and slowly in a downward decline of health. And all of a sudden finds themselves in a medical emergency, and we, the collected scientists, policy makers and others who care about this resource are a medical response team. What do we have to do? Well, the first thing we have to do it we have to stop the bleeding, and by that, in the context of the Puget Sound, I mean that we have to end the ongoing losses and degradation that we know are happening right now. Discharges of persistent bio-cumulative toxic contaminants into these shared waters is one of the areas of bleeding that I think we really need to try and stop as quickly as possible. Compounds like PCBs, mercury, dioxins…we don't have a great deal of information on exactly how much is still going in on a daily basis, but from the reporting that we have in the U.S. through the Environmental Protection Agency, it appears that upwards of a million pounds of toxic contaminants are still being discharged annually into the Puget Sound Basin. And these are just the ones that we know of. No natural system, as we all know, can continue to absorb synthetic toxins indefinitely. We have to stop the loss and the cementing of nearshore habitat, and the altering of the vital ecological processes that happen in the nearshore; it's another area of bleeding. We need to make sure that our sewage and industrial waste are properly treated before being discharged. And we need to fix the existing problems from the discharges of urban storm water.

Those are some of the bleeding wounds of this patient. Then we need to heal those other wounds of the past, of this lifetime of not taking good enough care of ourselves. And in that category of healing the wounds I would put things like cleaning up the contaminated sediments that have built up in the marine environment over time; there's more than 5,000 acres in the Puget Sound region that we're aware of; and there's many more thousands of acres in the terrestrial parts of the Basin that need to be cleaned up. We need to eradicate the invasive species that are the most pernicious in the environment…take those on first. And we need to continue to work diligently to restore nearshore and marine habitats in the most critical areas and to restore the natural processes necessary for a healthy system.

And finally, after we've done this work of stopping the bleeding and healing the wounds we don't want to go back to the ways that got us to this state of crisis. We need to learn to live a healthy lifestyle. And in the Puget Sound region this is going to be all about developing and adapting new practices and getting ahead of the continued growth that the Basin is expected to see; perhaps as much as 2 million more people in the next 20 to 30 years. We have to get ahead of that by having new development standards and practices in place that don't continue to recreate the problems of the past. Things like low impact development which deals with the best ways to convert land if it has to be converted…how to best manage storm water and sewage, how to manage shorelines.

We need drastic reductions in our use of chemicals and pesticides in the basin, and vastly improved solid and toxic waste management. I saw a graph the other day called a metabolic chart of business, and it had materials and energy on one side, going through a manufacturing process and then product and waste on the other. And the product side of this metabolic chart was 6 percent of the materials and energy that went in, and 94 percent of it was waste. So there's a huge amount of opportunity…economic opportunity as well as environmental opportunity is beginning to really reshape how we process materials and how we develop. If we don't make significant alterations to our development patterns and we get this expected growth, the system is almost certain to continue its downward trend lines. Albert Einstein once said, "The significant problems that we face today can not be solved by the same level of thinking that created them." And I think that's very true in the field of conservation, we need new approaches.

To exit the analogy of the medical emergency we don't want to simply slow the rate of decline and extend a poor quality of life. We want to reverse that decline and we want to prevent future decline. And of course we have to remember that we can't cure in one day what's taken generations to acquire.

So how can we get there from here? Well I have a few thoughts on that from my experience working in conservation around the Americas. I think we need to really focus and be strategic here. We're in an area of significantly declining

resources for all public activities, and especially for environmental activities, and we have to go after the biggest problems where we can get the most traction and the most payback. And part of that is getting some visible and exciting successes, because success breeds success. And we need to celebrate those successes and build on them. Dr. Norman Cousins said that "humans experience a powerful gravitational pull in the direction of hope," and the opposite is also true, despair breeds more despair and inaction. Hope gets people motivated. And our programs need to find ways to harness that energy, to move people forward. We have to really spend a lot of time and thought about how to integrate our efforts; even thought there seem to be many of us, relative to the scale of the problem, there are few. And with this complex jigsaw puzzle that we have of jurisdictions and agencies and responsibilities, we have to continue to improve our focus and our coordination and our integration. The Action Team and the Georgia Basin Ecosystem Initiative have been great steps forward on aligning strategies and actions. But we've got to build on those efforts.

One obvious target would be a shared educational program in this region. We need to have, at the very least, coordinated messages; know what we need to say to people about these problems and how to solve them and coordinate those messages and be targeting the same audiences. Another great target is coordinated science, and this conference is a testament to that. The Puget Sound Ambient Monitoring Program is a testament to that, our joint indicators work is a testament to that. We need to continue to build that kind of integration and cooperation. We need to open up the process, too—daylighting is always healthy—and get other folks, new people and new disciplines involved in helping us think through how to take on some of these problems. We need some breakthrough thinking, and we need to really look at how we apply law and regulation and try and figure out ways that are going to move us further in the direction that we want to go. Part of that is to place a very high premium on innovation and experimentation and to give people rewards for trying new things and for taking some risks.

And as we involve new people in this process, hopefully we can move beyond the polarization and stalemate that I believe serves no one's interest. Incremental progress is far better than stalemate and we can't let the perfect be the enemy of the good, which we all too often do in our debates about conservation and natural resource management. I prefer to work in what a colleague of mine from the Southwest calls "the radical center." People always think that two extremes are radical, but actually they're not radical at all. Nothing happens out there; that's safe—where nothing happens. Where things happen is where it's not safe anymore, where you put yourself on the line and take some risks and maybe fail…that's radical…that's the radical center.

Conservation has to be non partisan. It's about citizens. And we need to continue to place a high emphasis on education and getting to the tipping point on these issues with the region's population. Protection and restoration of the Georgia Basin and Puget Sound region has to be a local priority everywhere and that comes from the grassroots.

And finally, we need to have a high degree of accountability to do what we say and what we said we were going to do. That starts with enforcing the existing laws, and that starts with meeting our obligations and our commitments.

So in closing let me say again what a pleasure it is to be here and to be part of this vibrant and committed community of people who care so deeply about the future of our environment, and especially this most special part of the globe. Eleanor Roosevelt said that "the future belongs to those who believe in the beauty of their dreams." The work that we're engaged in to protect the shared waters of the Georgia Basin and the Puget Sound region is a beautiful dream, one that can become the future. And on behalf of one of the co-hosts of this conference, the Puget Sound Action Team, I want to thank the hundreds of scientists, researchers, natural resource managers, elected officials and others who are gathered here for all your contributions and for all your work towards this beautiful dream. I look forward to working with you in the months and years to come. Thank you. Thank you very much.

Now it is my pleasure to introduce our next speaker who actually is an expert on marine issues: Carl Safina is going to speak with us this morning. Carl has been involved with the sea all of his life, growing up on Long Island, fishing from a young age, and later studying the ecological relationships between sea birds and fish populations, which led to his doctoral work. He worked for many years with the Audubon Society founding the Living Oceans Programs and throughout that work and much of his other work he has been elevating the public profile of marine and fishing issues, and putting marine fish into the wildlife conservation mainstream. He's also a very accomplished author with more than 100 scientific and also popular publications on ecology and marine conservation including his books Song for the Blue Ocean; The Seafood Lovers Almanac; and The Eye of the Albatross. That last book won the John Burrows Medal. Carl has a Ph.D. from Rutgers University in ecology; he was the recipient of the Pew Fellowship, the McArthur Fellowship and also of the Lannan Literary Award, and we are really fortunate that Carl has joined us today and is going to share some of his experience and knowledge with us. So please join me in welcoming Carl Safina.

▶Dr. Carl Safina

Blue Ocean Institute, Inc.

Good morning, it's really a pleasure to be here and yes this is a very beautiful part of the world, so it is a pleasure to share it with you and appreciate being invited here. I'm going to do a couple of things here this morning; mostly I'm going to talk about fisheries. I think that fishing is not only the main way that people have changed the appearance of the oceans, but also that eating fish is the main way that almost all of us interact directly with the ocean. Certainly most people in this room interact in a direct way with the oceans. But for most people, the main interaction between humans and the sea is through consumption of fish and then participation on the consuming end of fisheries. So that's what I will be speaking about. But this will also be part autobiography and part book readings and part college lecture, so it'll be a little bit varied.

Can we get my presentation on the screen? There we go…good. And is it possible to bring the lights down a little bit because these will project much better and look much better if it's a little dimmer.

Ok…well the oceans mean many different things to different people. For many people the oceans are a place of beauty and inspiration, sort of a conceptual domain. Some people see the oceans as a place for recreation, some as a source of raw materials for their businesses. For many things that live in and around the sea, the ocean is wildlife habitat; it is home to many things, and the only home to many things. And I have seen the ocean in all these different ways throughout my life. This is me on the left (referring to screen)…and I can say that I will therefore be reporting to you on about 42 years of data and research.

Well, those childhood shore, which opened my heart, were something that I was hoping to maintain in my life, so as I got older I needed to find a way to avoid growing up and still feel like that 5-year old, up to my calves in warm shallows. And I discovered that there is an incredible social institution to prevent growing up, which is called graduate school, and I did take full advantage of it. And what I did was I studied the relationship between sea birds and fish, the foraging ecology of seabirds and fish. Most sea bird scientists started out as bird scientists and just decided that it's a lot easier to just collect a lot of data by walking around in a sea bird colony than it is if you have to climb to nests in trees all the time…or cliffs, which I've done a fair amount of myself and I can tell you that the sea bird is definitely a good way to get a lot of data, but. I came to it from a different angle; I came to it mostly as a fishing person not as primarily a bird person first. So I was more interested in what sea birds do at sea…which is really what they are is marine animals. So, rather than being in the nesting colony all the time, this is mainly where I worked, in the feeding flocks of sea birds, and I was looking at the distribution of prey fish and the interaction with predatory fish in competing with the sea birds and also making fish available. And that's been quite awhile ago…quantifying the prey schools on an eco sounding recorder.

But also in those days I did a lot of fishing and I still do a lot of fishing, although my perspective on it has changed quite a bit. But…as the sea birds were taking me farther and farther offshore, I followed them to start encountering animals that up until that time had become…had been mythical to me and then were suddenly becoming real, such as the mako shark. And this seemed like high adventure and good clean fun at the time, but there are different ways to look at it. One way of looking at this picture (referring to the screen) is that I've just caught this huge fish and…had all this excitement and…looking forward to some nice big steaks on the barbeque. Another way of looking at it is that this is essentially a sea-going grizzly bear; it's an animal that is a solitary predator,. Iit does not start breeding until it's about 15 or 20 years old and then it has only a few pups every year or possible every other year and I've just killed it. On land you couldn't just kill any grizzly bear you happen to come up against…regardless of what time of year it was. But when this picture was taken you did not need a license, still don't need a license, you can catch as many as you wanted. And although this looks like a big dangerous animal, which it is, it's also a juvenile, this fish is not sexually mature and it never would get the chance to breed because of me.

So the more I got involved in…offshore fishing and big game type fishing the more I started seeing things that struck me as excessive. This is a one-day catch of sandbar sharks in a charter boat (referring to the screen); it happens to be in Florida and this picture was taken in 1989. All of you have probably seen old black and white photographs of piles of dead bison on the plains or wagons full of passenger pigeons or cranes hanging up in the markets of San Francisco or New York or Chicago…you know that you can't take those pictures nowadays. In some cases the animals are completely gone and in other cases they are protected and not available for sale. This picture is scarcely more than a decade old; you could not take this picture nowadays, either, because although the sandbar shark was the common summer shark on the east coast of the U.S….I have seen one in the last five years. We used to see…you know, half a dozen everyday that we went shark fishing. And that's how fast we've been able to affect what lives in the ocean.

This is another charming photograph from the good old days (referring to the screen). This is the Bay Shore Mako Tournament…it's not this Bay Shore; it's another Bay Shore from where I live. And…you have to wonder what's wrong with our view of the ocean when the words "large, solitary, predator" and "sport" and "garbage truck" all end up in the same sentence, and in fact, in the same photograph. All these sharks were caught for fun; a prize was given for the biggest one and then they all went into the dump. And it turns out that when you fish it's as if there's no tomorrow, that's what you kind of get, you get no tomorrow. This tournament is one of the few that still remain to catch big sharks…along that coast. A lot of the other ones have gone out of business for lack of sharks. This one did a clever thing; they instituted a prize for blue fish; now, if you're from the West Coast you might not be familiar with blue fish, but blue fish is what people who fish for sharks…recreationally, catch for bait before they go out in the morning. So…for lack of sharks to win the prize they instituted a prize for bait. It would be like having a bass tournament and, because there are no bass left in the lake, you give the prize for the biggest night crawler.

Now that may seem funny, but, this is what happened with recreational shark landings on the East Coast, where I come from (referring to the screen). And you can see that in the early days…the first dot on the graph is the highest dot on the graph…that's something that you'll get familiar with in a moment. And then that's followed by a bad year, especially that there's a lot of jumping around in data from recreational fishing because recreational fishing is especially sensitive to things that change from year to year, like weather, you know, if it rains on the weekends for a few weeks in a row you'll get a big change in effort. And this is just landings so mostly it reflects a combination of landings and what's happening with the populations. So people think, well there was a really good year and there was a really bad year. Then the next time that there's a really good year, people get accustomed to the idea that it jumps around; good years follow bad years and nothing to be alarmed about. But the next good year is not as good as the last good year, and the next bad year is worse than the last bad year. But so far nobody thinks there's any kind of problem at all. Then there's another good year followed by a bad year, which is what everybody's come to expect, so why be alarmed? The next bad year is the lowest year yet, the next good year is about as low as a good year ever is going to get, and then suddenly everything goes wrong and people seem surprised.

So as a bird person in those days I started to think…to myself, well I wonder what fish people know about fish populations, and if there's any data on fish populations? So I started rummaging around and I discovered what I have come to call over the last decade or so: "the fish graph." And the fish graph starts high and ends low; and you can put hundreds of names of different fish under it and essentially draw the same graph. And…it basically is high in the 1960s and 1970s and then crashes through the 1980s. I would like you to remember only one thing for now, one thing I will come back to, is the striped bass on the East Coast had their lowest year on this graph right about 1981, so please just keep that in mind for later.

Even the great tuna populations of the wide open Pacific have been in long-term decline. And this is something that surprised me. Just a couple of years ago I wrote a chapter for an academic book about world tuna conservation, and I really wasn't expecting to see this in the data, but Pacific yellowfin tuna…these tuna spend hundreds of days a year spawning and they lay hundreds of millions of eggs and yet...long-term decline. And people say, well how could you… you can't possibly over fish them, they lay millions of eggs? Well oak trees make millions of acorns but if you cut the tree down that's the end of the acorns right? And this is…from 1975 onward through the 90s…this is Pacific big eye tuna from 1950 on through the early 1990s, and you can see the early decline that…that happened. On the West Coast here, rockfishes…if you change the name basically the answer is that they were once abundant and now are scarce. Cod, it doesn't matter what kind of cod you're talking about pretty much whether you're talking about cod in New England or Ling Cod, which is an entirely different thing right here, the fish graph pertains.

Some people may think that it only seemed good in the good old days because that's the way we remember things…we were smaller and younger and the world seemed bigger, and everything seemed bigger. And if you look at these engravings (referring to the screen), because there's not that much data from way back hundreds of years ago, so it's hard to reconstruct what the world was really like…most of the scientists who have ever lived are alive and working right now. And for what might substitute as data we might often have to go backwards to look at things people drew, and this guy is about to go fishing for cod with an enormous hook that looks more like a meat hook than a fish hook and these people here have caught filets that look more like boogie boards than they do like fish fillets.

So what does this tell us about the way the world once was? I would say it tells us pretty much nothing at all because it's not trustworthy data, it's an impression that's been relayed through a drawing and this guy may have just been awestruck when he drew this or he may have felt that it was so impressive that he needed to take some artistic license and exaggerate a little to try to convey the impression he had. So you really can't tell a thing by it.

But there are some very clever scientists working nowadays who are able to piece together some things that are more concrete. This is the size of cod in the Canadian Maritimes and New England over the past 4,500 years and this is put together digging up the…the middens of Native Indians and early settlers and looking at…things more modern times. And just taking bones from particular parts of the fish and see what the average size is. And…what you get is a picture that says that cod once got really big, when Europeans arrived, there was a noticeable decline and in the last 50 years or so there's been a catastrophic drop in size and that's because fishing pressure is so incredibly intense they just don't get to live very long.

Who manages our fisheries? There's the Department of Fisheries and Oceans, there's the U.S. Department of Commerce, there are all these people and it's their job to manage our resources…into the future. But there are so many entities; in many cases their directives conflict, their constituencies conflict and…the overall picture is that the job that many of us would like to see, which is those graphs at least have been flat or increasing from low points, has not generally been what's happened. So it seemed to me that we were treating the oceans like we were treating the bison and the passenger pigeon and all these other things that we once thought were vast and inexhaustible. And those of us who thought of ourselves as wildlife conservationists have pretty much totally overlooked most of the wildlife habitat on earth.

So I believe that like these sanderling we should stop just looking at the ocean and actually get our feet wet. And…I did start a program in marine fishery conservation at the National Audubon Society and then I went to the World Wildlife Fund and Natural Resources Defense Council and Sierra Club and a few other groups and said, "You know there's a big wildlife crisis just off our shore and we should all be more aware of that and start working in it and make marine fisheries and fish conservation and fish restoration part of the mainstream agenda of the Conservation Community."

Why should we bother doing this? Well many people think that the goal of conservation is to prevent extinctions. And I do believe that most of the public and most policy makers think that that's the goal, and I think that that's been a major strategic mistake that we've all made is to frequently reinforce that as the goal…that we're working to prevent animals and plants from going extinct. I think the…wrong place to put our emphasis, because by the time we are faced with things that are threatened or endangered, we have a lot of trouble turning the situation around; it's expensive to do so and the outcome is quite questionable, by no means assured. The time to save species is when they are abundant and when they are contributing money to people and when they are contributing to people's sense of who they are. I don't think there's any place in the world where wild species do more of a job of…helping people understand who they are and where they live than right here in these watersheds where the great salmon populations and the vast forests are really how many people have defined what it means to be human and what it means to live in a particular place with a sense of place. And that, I think, is where to start…not the endangered species list.

So I'm going to try and tell you a few case histories; one has to do with a big fish that's called the giant tuna, they don't call them giant tuna for nothing, and the other…the other name for it is the blue fin tuna. Here's its fish graph (referring to the screen): high through the 1970s crashing in the late 70s and early 80s and now bumping along at an all time low. There are several populations; there is an Atlantic population, there is a Pacific population. This is for the Atlantic population, this graph. At one time, like those old pictures of sharks, these fish were slaughtered just like the buffalo were slaughtered. Here they are rotting in the sun (referring to the screen) off Bimini in the Bahamas, coming through their spawning…after their post-spawning run up the Straits of Florida they were caught by recreational fishers for prize money and then…just pushed off the dock basically. There are stories of Earnest Hemmingway being drunk and using giant tuna for punching bags. He was a good writer however…

This is what this fish looks like when it's still a fish (referring to the screen) and…I'll do a quick reading from my first book. This is from a morning I was out on my boat, about 30 miles out at sea and it was a very calm morning. (reading) "Nothing had happened for a few hours, I was fishing…and then what caught my eye was a faint chevron bulging ever so slightly from that molten glassy sea 50 yards from where I sat adrift. As I rose to my feet to study it, the chevron grew to a distinct wake, a wake without a boat. The wake ran along the surface for a few seconds, accelerated and exploded like a revelation. A giant blue fin tuna among the largest and most magnificent of animals hung suspended for a long riveting moment, emblazoned and back lit like a saber-finned warrior from another world, until it's 600 pounds of muscle crashed into the ocean like a boulder falling from the sky. That morning I saw something not new, but different. I saw this fish not as a struggling opponent at the end of a line, or potential dollars at the fish house, but as a wild animal, a perfect master of its element, no less spectacular than a bear or an eagle. No less spectacular but perhaps even more venerable."

"In a world older and more complete than ours," Henry Beston wrote in The Outermost House, "they move finished and complete." The blue fin tuna is clearly complete; some say it's nearly finished. Scientists calculate its population off the

Eastern seaboard of the U.S. and Maritime Canada has declined nearly 90 percent since 1970, and they say reproduction is now very low. But, commercial fishermen, good fishermen and good people, say that this is hogwash…that the fish are abundant and increasing. This debate is more than academic because an adult blue fin may be worth more money to the person who can kill one than any other animal on the planet—rhinos and elephants included. Probing for the truth to this debate requires following the blue fin, and its trail leads in many directions. But mostly it leads through the looking glass surface of the ocean, revealing that while the ocean may look the same as it has for millennia, is has changed, and changed greatly.

This is a view of about 10 giant tuna (referring to the screen) straight…looking straight down from an airplane at the sea surface with these fish traveling just under the surface. And we're not up there because the pilot loves flying around finding tuna, we're up there because this boat has hired him to fly around and find isolated little groups of tuna in the vast wide sea. That was about…on average prices, that was about $100,000 worth of fish that you are looking at in the last picture. And…when I finished my first book the highest price ever wholesale at auction for one of these fish was over $80,000 and we thought that that was incredible. By the time I finished my second book…blue fin tuna had been sold wholesale for $170-something thousand dollars, U.S. money. So with pressure like that…for this project it's not surprising that this is what this graph looks like.

The politics involved just make it impossible for this fish to survive, and for the tuna commission, who we know, who has paid staff and all these scientists from all these countries to do the job that they are supposed to do, which is manage for sustainability…it says so in their charter. But there is a commission…The International Commission for the Conservation of Atlantic Tunas, which I affectionately refer to as "The International Conspiracy to catch all the Tuna," started their 30-year rebuilding plan this year. This is the beginning of their 30-year rebuilding plan and they will argue viciously that it is a success because this rate of decline (referring to the screen) is less than this rate of decline was. But when you go out on the ocean expecting to see what you saw as a child, it's not funny. It's hilarious but it's not funny. And I wish that I could say that was an isolated incident, these are the fish that the commission is supposed to be managing (referring to the screen), these are the fish that its scientists say are all over fished.

Swordfish was another thing that we once had…well within the lifetimes of many people who are now alive, are still alive. You could reasonably expect to go out fooling around with a rod and reel…these are not commercial fishermen these are recreational fishermen (referring to the screen) and reasonably expecting to catch giant swordfish in the course of a day. This is what the average sized swordfish looks like now (referring to the screen). That's a swordfish on a commercial longline boat…that's another one, look at the planking on the deck here, these fish here are all about 40 or 50 pounds (referring to the screen). They don't start laying eggs until they're 125 pounds or so. And that's because the introduction of…a simple but very efficient form of gear, the longline, which is a long fishing line with hundreds of thousands of hooks…replaced harpooning. Harpooning could only take big fish that were basking at the surface.

Now people still say that, you know, it's a big ocean out there, we do so little fishing…you look at the ocean you don't see any fishing boats most of the time. How could we really affect anything out there? We have, in fact, done some experiments, that were not designed as experiments but they will have to substitute in absence of well-designed experiments, where we apply and subtract fishing pressure from populations of ocean fish. This is the Atlantic Swordfish's population trajectory in the North Atlantic Ocean (referring to the screen)…this is the 1950s…this is where longlining began. When longlining began the population started an immediate decline. Then there was a health limit set for mercury that stopped all the fishing in Canada and the United States and the Swordfish population immediately started to increase. When the mercury limit was relaxed and the fishing got back underway it started right from there and went into a very long-term, catastrophic decline. In the last few years, following a swordfish boycott and reduction in the fishing quarter by the commission, because the deal was that we would end the boycott if the fishing pressures were reduced and some of the large nursery areas were put off limits as protected areas for…longlining gear. Immediately this turned the corner and started coming back up. Unfortunately they've now increased the quota back to where it was again so that line may turn back down. But this population, as many others, has shown itself to be very sensitive to the fishing pressure because the pressure applied is actually very considerable.

Sharks are another thing. I used to love to show this picture to the Audubon Society people because everybody would freak out that. "oh my god a bird almost got killed" (referring to the screen), but actually the bird got away. And…the Fisheries Service in the United States, my beloved country…whose wisdom is sometimes a little bit limited, said here in 1985, notice, 1985, that, this here paragraph, for those who can't read English, what this really says (referring to the screen), I'll translate, is (sarcastic)"tuna and swordfish are crashing because we're not doing our job and because of political pressure we will encourage people to fish for sharks, the only large fish that are not devastated yet. We have no

idea how many sharks there are and we have no management plan, however, we are going to subsidize people and help them exploit shark fins. Be careful when handling a shark." (audience laughing and clapping). I do a lot of reading…so.

So people caught a lot of sharks, and they sent a lot of sharks to the shark fin markets, and...I live outside of New York, and in New York we have a place called the garment district where for several blocks on either side of the street every shop sells garments, that's why it's called the garment district. And in Hong Kong they have a shark fin district where for several blocks on both sides of the street every shop sells shark fins. Worldwide, sharks kill an average of 10 people per year, and people kill an estimated 50 million, and I've seen estimates as high as 100 million, sharks per year. People in the ocean are very dangerous apparently. So, mostly the sharks are killed for their fins, which are mostly used as a thickener in soup. And shark fins from all over the world find their way into these markets because there are buyers pretty much everywhere.

This is a nice family on the Caribbean coast of Costa Rica (referring to the screen). They have a couple of shark fins; he's got a Cayman skin. These people are just doing what it takes to survive and get by, they're not in charge of fisheries, they're not trying to destroy the world, this is not the face of evil. They're just a couple of nice people and their kid trying to make a little money. This is a less innocent and less benign form of fishing (referring to the screen)…it affects those people you saw in the last picture and it certainly affects the shark populations. Most of the sharks in this net are 20 years old and up and you cannot fish like this in the same place for too many days because it takes more than a week to grow a 20-year-old shark.

So this is a mining operation, or the ocean equivalent of clear cutting. These are shark landings in Hawaii (referring to the screen); this is…a lot of, a lot of things that were once sharks in the Pacific Ocean. You see only the fins, you don't see the bodies because the bodies were dumped at sea because the boat was mainly interested in filling up with tuna and swordfish, but those fins are worth some money, so why throw the sharks back?

Now what happened on the East Coast after 1985 when fishing was, shark fishing was actively encouraged by the U.S. government…here's 1985 (referring to the screen), and this, these are data points from various East Coast ports. Before 1985 there were a lot of sharks in a few places and an average number of sharks in the average place, and essentially no place had very few sharks. And since 1985 every place has only very few sharks. The difference has been incredibly noticeable I can tell you because I have been shark fishing myself, recreationally, over the last 20 years and I have seen a major, major change in what you see at the surface. We used to run until we would see shark fins, from shark swimming around. We would say, ok there are sharks here, let's stop here, and…we almost never see them anymore.

OK. Get off of the overfishing thing for a little while. This is an albatross (referring to the screen) subject of my most recent book The Eye of the Albatross. That's what it's supposed to look like…and that's what an albatross looks like when it has encountered a longline. And this is just emblematic for a thing called by-catch, any time you go fishing for anything you catch stuff that you're not trying to catch and that's called a by-catch or by-kill. And it turns out that more than a third of everything caught in the ocean is not wanted and is shoveled overboard dead. This is the way a turtle is supposed to look and this is the way it looks in a shrimp net (referring to the screen). And in many places shrimp nets are the highest source of mortality for adult sea turtles, all of which are listed as threatened or endangered. This is the contents of a shrimp net (referring to the screen), and although this picture, from where I'm standing, looks very grainy right now…there is a shrimp and there is a shrimp, and the rest are crabs, sea stars, lots of juvenile fish that would support other fisheries if they weren't killed by the billions. There's a skate in the middle there. Every pound of shrimp that gets to the table represents about 4 to 10 pounds of other sea life that was shoveled off the deck. And of course when we catch these things, we catch not only what we see, but also the generations that they would have spawned.

The other issue that is a big one besides over fishing and by-catch is habitat of course, and many of you spend a lot of time trying to help protect and restore habitat. This is the habitat for Pacific Salmon, there's a nice chinook or pink salmon (referring to the screen), not a terribly big one but a beautiful fish none the less. This is of course also habitat for salmon; you cannot have one without the other and expect to still have salmon. I'd like to read another passage, this one again from my first book, (reading)

"In a quiet stream high in the mountains dark forest, a single salmon scratched and dazed and already spotted with fungus is finning weakly in the slow current. Hers has been a life of almost magic miraculous luck, she has done all a salmon can do, and here, spawned out, spent, fulfilled, that life will end. A time to die. She drifts slowly downstream until she hits a gravel bar and for the first time since she hatched and wriggled from the gravel of this very stream, she stops swimming forever. I wonder if a vision of her life is flashing before here as she lies here with that one unblinking eye staring up

at the enormous trees overhead and a sunlit sky beyond them. I suppose not. I can only suppose she has no recollection of the urges that have driven her. No recall that as a youngster she left this stream to travel the ocean's broad roof to the deep heart of the sea and back, and I suppose she can not remember now fighting her way back against the river's torrent, and leaping up sunlit falls, choosing a strong mate. Does she even know that she has laid her eggs and fulfilled her part in shaping the future? Can she remotely realize that each day she lived comrades fell to natural catastrophes, and cunning predators, and diseases, and accidents, and nets, and hooks and the structures of humanity. As she lies dying here can she possibly understand that she has survived? Everything that can possibly go right for a salmon has gone right for her but for most salmon here along this coast, the reverse applies. Once, salmon were merely the world's most complicated fish, spending part of their life as freshwater fish, part as saltwater fish and yet another part again as freshwater animals bent single mindedly upon self destruction through reproduction, immortality through suicide. That life and story have become increasingly complex. Nowadays one can not see the salmon's world without adding to the tale the complications of logging, agriculture, hydropower, damns, politics, pesticides, foreign markets, private property rights, public property fights, recreational, commercial and subsistence fishing and artificial reproduction. The great Northwest of Pacific Canada and the United States have become the world's extinction epicenter for ocean fishes. Nowhere else in the world are ancient lines of marine fishes vanishing with such haste. Pacific salmon have disappeared from about 40 percent of their breeding range in Washington, Oregon, Idaho and California. In that region salmon are either extinct, endangered or threatened in two thirds of the area they occupied 10 decades ago. Extinction is an unusual form of death because while most death ads a spoke to the wheel of life, extinction carries a peculiar finality, and end of lineages, a preclusion of futures. As the poet Gary Schneider put it 'death is one thing, an end to birth is something else.'"'

OK. When we damage coastal habitat and estuaries, we damage not only what lives there but of course it affects what goes out and populates the rest of the coast. Nobody can understand that better than people who live with salmon. We have other forms of fishing that…well we have forms of fishing that directly harms habitat as it works. In the upper picture here (referring to the screen) this is the sea floor bottom with lots of little…bryozoan colonies, sponges and things like that. The bottom picture shows a sea floor that has been scoured by patrolling. About half the fish in the world are caught by dragging bag shaped nets across the bottom of the bottom, called bottom trolls. And these harm the habitat as they work…especially if they work on hard bottom. It's like going out to pick mushrooms with a bulldozer, you would get the mushrooms, and you would also take the conditions that created the mushrooms away. And that's exactly what we've done…these little colonies and things are where the food that feeds the fish that we're interested in grows, and where the babies of the fish that we are interested in hide.

Coral reefs are an ecosystem type that is under pressure throughout the world from a variety of things: fishing with dynamite; fishing with poisons; sedimentation from farm run off; sedimentation from clear-cut logging…pollution from sewage. And this is an albatross again (referring to the screen) on a place called Laysand Island. Laysand Island is farther from any continent than any island in the world, and it doesn't look very far from us does it? Our calling cards are everywhere, not just in the form of fishing debris, but liquor bottles, cigarette lighters, toothbrushes, welcome mats, umbrellas, bowling balls…I never knew a bowling ball floated, but apparently it does because I found a bowling ball on Laysand Island.

Now this is the way that the future gets passed along from one generation to the next…the parental care between the bird and its chick. And this albatross is trying to feed its chick the cap of a jar, the screw cap of a jar that it has swallowed. You can tell where albatross chicks have died the year before because you can see their vertebrae and a pile of feathers, and then all these colored bits of plastic that were in their stomachs when they died. All the albatross chicks have plastic, it doesn't always kill them, it never does them any good and it does sometimes break into sharp pieces and kill them outright.

(Reading) "In the world that shaped albatrosses, the ocean could be trusted to provide only food, parents to provide only nourishment. Through the care bond between parent and offspring passes the continuity of life itself. That the flow of this intimate exchange now includes our chemicals and our trash indicates a world wounded and out of round, it's most fundamental relationships disfigured. But don't pity just the birds. Albatrosses inhabit few islands, but humans inhabit only one island: a blue and white orb within a soap bubble afloat the great dark universal sea."

Our various kinds of trash cause misery to a number of different kinds of sea animals. This turtle (referring to the screen) mistook a bag for a jellyfish and choked.

OK. Now just a slight change of pace. How does all of this fit in a global context? This is…the best-corrected estimate we have of fish landings that, this dark line here (referring to the screen). And I say corrected partly because…Daniel Pauly,

who is now here working in this city…figured out that a lot of the catch that was reported by China was overestimated, so adjusting it for reality, you get this as the best estimate. And what you see here is that right around the late 1990s, the world catch, which had been going up at a rate that was about parallel to the human population explosion, the world catch started to fall off, despite continued fishing pressure, and in some cases increasing fishing pressure. Who does most of the fishing in the world? It's mostly Japan, Russia, Peru, Chile, China and the United States…those are the big fishing countries. And a lot of fishing is not just…a couple of guys in a small boat pitting their courage and their muscle against the sea. A lot of it is highly industrialized…this boat (referring to the screen) has a 20-ton hold of a fish called orange roughy on the deck; it's a boat from New Zealand. And orange roughy appeared on menus in North America right around 1990. Around 1995 it more or less disappeared from menus because these fish that this guy is standing on 20 tons of don't breed until they're 30-years old. So they can't possibly hold up under pressure like this, and they didn't.

Meanwhile the tonnage of the world's fishing fleets continues to increase, fishing pressures continue to increase mostly because of perverse subsidies applied to failing enterprises, and the price of fish shot up much faster than the price of…other kinds of animal meat. That's a little easier on us in North America; we eat less fish than anybody else in the world. But these other people who we're bidding against rely heavily on seafood for their animal protein. So the overall picture in the oceans, and, this slide (referring to the screen)…I got from Daniel Pauly, it's a nice illustration. The ocean's used to be full of fish and a lot of them were big, and now there are far fewer and far fewer of the more big fish, and the continental shelves which were once very rich with life have been largely changed.

So many people ask, "So why not just grow fish like we learned how to grow animals for food about 10,000 years ago?" And we are doing that…Aquaculture is the fastest growing segment of agriculture and it does provide seafood, but it has a lot of unintended negative consequences, ranging from pollutants to introduced species, to conflicts with users and conflicts with other wildlife. Here in British Columbia we're now growing lots of Atlantic salmon. Atlantic salmon are going extinct everywhere Atlantic salmon normally live and over here they're helping to cause declines in native Pacific salmon. So everything is really kind of out of whack.

Uh, this is a very poor projection of this picture (referring to the screen), but this is an airplane window and I'm looking out of the window at Manila Bay. You can see a big aquaculture pen here and this whole bay is reticulated with pens and other stuff. And I hope that I don't live to see the day that our shores in all the estuaries in North America are full of people's private enterprises growing fish. The other thing to keep in mind is that fish are not cabbages, they do not grow on sunlight like cabbages do and corn does. You have to feed them something and mostly what you have to feed them is fish, and most of the fish you have to feed them are caught in the ocean. So it really doesn't take pressure off of the ocean, it's actually, in many cases, a net loss of edible protein that people could have eaten. Above this dotted line (referring to the screen) are types of fish where you have to feed them more than you are going to get out of them. So, for instance, if you're growing eels, you have to feed them 4.7 pounds of fish to get a pound of eel back for you to sell. And then below this (referring to the screen), these fish are largely vegetarian, or can be fed a vegetarian diet so that at least is a gain of animal protein and is therefore better. This guy (referring to the screen) is raising Tilapia indoors; if these Tilapia get out of the pen they are not going to wind up in the pond or the river and escape all over the place, they're going to wind up drying out on the floor, which is a good thing for escaped Tilapia to do. And he's feeding them soy-based, palletized food, the outflow of water can be cleaned and controlled and…it's relatively speaking, a good way of doing it. So there are better ways and there are worse ways of growing fish.

Now comes the good news part of the talk, which…(laughing)… probably we all need. I showed you lots of graphs going down, now in 1994, this year (referring to the screen) large parts of George's bank, in New England…were closed. George's Bank is fished by boats from mostly New England and Canadian Maritime provinces. Up until those areas were closed there was a constant decline, and then as soon as they were closed there was an increase in some of the important species there. And so the first message is that there is a lot of resilience in the oceans. While the oceans are vulnerable and they are sensitive to pressure, they're also sensitive to the removal of pressure and there is a lot of resilience and a lot of potential for recovery…especially as long as we don't replace ocean habitat with our own structures. On land we have lots of problems because a lot of the things we do are pretty permanent or quasi permanent. In the oceans what we've done is simply catch too much fish and if we leave them alone they know what to do.

This is the recovery of striped bass on the East Coast (referring to the screen); the greatest recovery of fish anywhere in the world probably, and remember I said remember what the striped bass graph looked like at a low point in 1981, and pretty much an explosion since then and that was because of…a conservation program that essentially enacted what you were told the first time somebody took you fishing as a child. They said, "We're going to throw back the little ones and we're going to leave a few for tomorrow." And this plan that resulted in the recovery of this very important food

and recreational fish on the East Coast had two simple things that it did. It allowed females to grow to a size where they could lay eggs on average twice before they could be caught and kept, and then it instituted a limit to how many could be caught and kept. That would allow them to breed faster than we were killing them. So recovering fish populations is not very complicated; it's not one of our more difficult environmental challenges. If we want to solve the global warming problem we have to change civilizations' entire approach to energy and that is a complicated problem. But just letting fish get big enough to lay eggs is not a complicated problem.

We've seen in the last few years recoveries of things where we've kept the pressure down. We now realize that we have to protect animals that we once feared and we're starting to use international agreements designed for wildlife to extend to wildlife in the ocean, like CITES, the Convention on International Trade and Endangered Species. Some of the by-catch problems that I showed you have some very simple solutions to them. In the U.S. we have a newly overhauled law, well not new anymore, but an overhauled law the Fisheries Conservation…Fisheries Recovery Act it's called actually. And it mandates that over fishing be…over fishing is now prohibited, mandates that you have to keep fishing pressure below the reproductive potential of the fish, and that fish populations have to be rebuilt. And that is now in the post-legislative phase where after you get the law passed you spend about 10 years trying to get it implemented and…there are lots of lawsuits trying to force its implementation. But there are also quite a few examples now of populations that are recovering as a result of some new legal restrictions and better regulations. And even the United Nations have done things that have been, in some cases just emblematic, like the Year of the Oceans a couple of years ago, and in some cases very real, like the High Seas Driftnet Ban. There were about 1,000 boats putting about 40 miles of netting into the Pacific Ocean every night, 40,000 miles of netting every night, and for the most part they're not doing that anymore so that's something that is real.

I showed you that picture of sandbar sharks and I told you that you could not take that picture anymore because it was taken in 1989. This picture was taken in Honolulu in 1999 (referring to the screen), and I'm happy to say that you cannot take this picture anymore because after several years of battling and lobbying we were able to get the U.S. Congress to make it illegal to land shark fins without a shark attached to them in any port in the United States. So many sharks are now being released as a result of that because it's not worth filling up a boat with sharks when your main money fish is tuna or swordfish. So, here's a picture from the archives (referring to the screen), can't take it now…that's good. You can get turtles out of shrimp nets by just putting a grate in the net; the shrimp pass through, the turtle hits a grate and goes out a trap door. Here it is working (referring to the screen); it's not as perfect or as simple as I just described, but it does work and it does save turtles. And now the challenge is not to develop it, to develop a way of saving turtles…the challenge is developing a way of getting people who are dragging these nets all around the world to use it, not just in some places that are now mandated to use it.

Here is a longline boat (referring to the screen), they're setting the line out through this chute in the back here. You can see lots of birds very close by the back of the boat, that's how birds get hooked; as the line is going out they come to try and get the bait…that's how they get hooked. This boat is dragging four ropes, one, two, three, four, ropes around the long line (highlighting with pointer on the screen)…here's the longline going out, there's the branch line with the bait on it right there. And this is not too far from here really; it's in the Gulf of Alaska. These ropes have…they go out about 50 yards; they have buoys that are splashing around back here. The birds are afraid of them; they don't want to come swooping in with their long wings and risk breaking a wing on something. There's too much obstruction here to get to the bait…by the time the bait is back here (referring to the screen) it's too deep for the birds. And all of this stuff keeps all of the birds back here. Here's the bird flock back here (referring to the screen). So this problem that is endangering several albatross populations with extinction can be solved by dragging four pieces of rope behind the boat.

As I mentioned earlier, many people affect the ocean by eating seafood and instead of trying all the time to get the regulatory agencies to regulate, one thing that we can do is just tell people what seafood is a little bit better to eat and a little more sustainable or better managed than others. A quick little anecdote on that, just a few years ago we started highlighting Alaska halibut because the Alaska guys all started using those scare lines behind the boat and they had cut their albatross by-catch very, very considerably and that was now in the regulations and they had to do it. So the halibut guys in British Columbia called and they were upset and they said, you know, "It's not fair that you're highlighting Alaska halibut and we fish in the same population of halibut". And I said, "Well but the problem is, yes, the fish is well managed but it has the by-catch problem with the albatrosses, so if you do the same kind of thing, you know, we won't… we will just stop highlighting Alaska halibut and we will highlight British Columbia halibut." And that's the direction that it's going so a little publicity just help set up a little bit more of a sense of competition for putting best practices in place. It's nothing, you know, terribly radical, it's not anti-business or anything like that…it just helps out all around and it's not too much of a hardship to do some of these things.

So I would like to leave you with…the idea that although a lot of the problems I showed you and that I talked about are real problems, there's also a lot of life left in the ocean, there's a lot of vitality, there's a lot left that should energize all of us on a daily basis to keep working and keep fighting for it. Take the places that are still teaming with life and protect them; take the places where life has been depleted and restore it. Dream about encountering some of these creatures some day and keep them in our world. Go to beautiful places; keep our backyard and our local area as beautiful as it is and can be again. And so perhaps like this colleague of mine (referring to the screen) walking along the beach in Hawaii looking thoughtful…the question is not should we be optimists or pessimists; the question is how does each of us find our role in the solutions and in making the future better than the situation that we have today? So the oceans are clearly trying to tell us something; the fish have a message for us and it behooves us to pay a little attention and to think about what we're hearing. And hopefully we'll get back to a point where people and oceans can live in harmony once again.

Luncheon Session
April 1, 2003

Bruce Kay

Manager, Georgia Basin Ecosystem Initiative Coordination Office for Environment Canada

Well good afternoon ladies and gentlemen; I hope you're enjoying your lunch this afternoon. We have a full crowd out here and it's great to see so many of you here today…to join us…at this great conference. My name is Bruce Kay; I'm the manager of the Georgia Basin Ecosystem Initiative Coordination Office for Environment Canada here in Vancouver. And it's my pleasure on behalf of the conference…to introduce our keynote lunch speaker, **Mr. Stephen Hume.** Stephen is a visiting lecturer in journalism at the University of Victoria, and a Senior Writer and Columnist with the *Vancouver Sun*. His journalist career spans 30 years in which he has covered everything from prize fights to Prime Ministers, and I'm not sure whether any Prime Ministers were involved in any of those prize fights but...In 1989 he joined the *Vancouver Sun* as "The Columnist at Large," where his in-depth coverage of social issues served to educate the broad public. Stephen is an award-winning author of six books of poetry, essays and natural history. He also has more than a dozen journalism, poetry and essay awards to his credit, including the Canadian Policy Research Award in 2001, and the Jack Webster Award for Journalism in 2002.

Please join me in welcoming Mr. Stephen Hume.

▶Stephen Hume

(Speaking in Chinook.) I thought it might be appropriate to begin my remarks today with a greeting in the truly indigenous language of this amazing place. That was Chinook that I was just speaking; it's the trade language that's fused from *halcamalum* and *Nasqualley,* from Russian and *quaquala,* from English and *schaniamous*, from French and *henelocut,* from Spanish and *Nuchanolth,* from Boston twang and from Cowichan. Some of the language that left words in Chinook are…are now extinct, the worlds that they contained are lost to us forever. And yet there were speakers of Chinook in my own family. And it was not so long ago that reporters at the *Vancouver Province* were issued a Chinook dictionary; and indeed at my daughter's christening, the Priest gave the benediction in Chinook.

Chinook laid its template on this place long before British and American colonizers carved it up. So I chose Chinook to begin because if there's a symbol for what the participants in this conference are hoping to achieve, I'd say it would have to be Chinook. It represents a consciousness of the place that transcends borders, cultures, politics. Chinook was the pragmatic response of the people to differences, but it was a response that said, "If we can't find a common language, we'll invent one." And surely that's what a science-based conference like this one seeks to do.

So…*(speaking in Chinook)*…good afternoon. It's really an honor to be speaking to such a distinguished group of experts, although I'm still a bit mystified as to why someone like me was asked to offer his opinions today. If we accept the definition of an expert as being anyone who is more than 20 miles away from home with a PowerPoint presentation (audience laughing) I guess that excludes me because, well, I'm a good 40 miles away from home, and I don't even have slides or an overhead; I've just got these sheets of paper with some ink on them! But then maybe I do qualify because there's always P.J. Plougher's definition of an expert. He said, "An expert is any person who knows enough about what's really going on to be scared." And in my view, anybody who doesn't consider the trends that have brought us to our present state of affairs as a bit worrying, probably isn't paying attention, or has a vested interest that requires putting on the rose tinted spectacles. Mind you in this world of…30-second sound bytes and media that starts wondering why the war in Iraq has been taking so long a week after it starts, I guess it's easy to lose sight of the long view. But we shouldn't lose sight of the long view.

I do want to be clear about one thing from the outset, I am…I am not a scientist. I was trained as an anthropologist and that's sort of maybe a soft scientist I guess, but…I'm not a scientist. I wouldn't pretend to have the kind of knowledge that's in this room today. And yet much of what I do as a journalist seem to echo in some part the functions of science. You might want to consider how both a journalist and a scientist begin with a keen observation of events in the natural world; how both are committed to the accurate recording of data as intelligently as possible, within the framework

of our biases and the limitations of our perceptions, social, cultural, philosophical, political or otherwise; both are concerned with understanding how those data correlate; and both are concerned with attempts to draw meaning from the observed relationship or absence of relationships within the matrix of our available understanding. And we're not alone in this endeavor; two other kinds of experts do precisely the same things, although for entirely different purposes. For example: the aboriginal hunter employs all the skills I've just mentioned to achieve his own pragmatic ends. And if the hunter resembles the scientist in his search for prey, that is a manifestation of reality, then it must be said that the poet resembles the journalist in the attempt to penetrate the scientists reality with intuition and the intangibles of dreams and imagination.

So what do poets and poetry have to do with a research conference on the Georgia Basin and the Puget Sound? Well I think they have a great deal. It may be the scientist's objective to make people know things about the world they live in, and it may be the journalist's task to make people understand what they've come to know as a consequence of the work of science and research. It's the poet's objective to make people experience the intangible, to make them feel the meaning of their knowledge and their understanding of that knowledge; to open the heart to the unknown and the unknowable that surrounds even the greatest mind and the most penetrating insight. So poets and poetry are there to make us feel humble as we play with what Sir Isaac Newton described as "our tiny pebbles of knowledge at the edge of the vast ocean of the never to be understood." Poets attempt to take us beyond the physical parameters of understanding and beyond the boundaries of the scientific world. Poets seek to take us into the moral and spiritual dimensions of the world we inhabit, this magnificent place of sea and mountains, the sky with its immeasurable shades of grey and tints of refracted light. They seek to show us what the occupation of this place means to the marrow and the texture of our lives as inhabitants of what the California-born, Alaska-educated, British Columbia poet Charles Lalard has called "The Sitka Biome." That wet, misty, mild, unbelievably fecund climatic zone of which the Georgia Basin and the Puget Sound are the heart.

Not long ago I was…chatting with a bright young scientist. He seemed kind of bemused by the presence on my office shelves of a range of literary works: poetry, plays, novels—stuff of little concern to the serious academic. Imagine that; the eloquent works of essayists like Roderick Haig-Brown and poets like Terry Glaven and Jay Michael Yates, and visionary novelists like Harry O'Hagen…all robbing shelf space from the learned treatises upon which empirical academic knowledge is built. He seemed to feel this…clutter of creative literature got in the way of true understanding. But in fact, it's the opposite! Too much of our science and policy is disconnected from the spiritual and moral comprehension of where we live. And yet it's that kind of understanding that lies at the core of what's being attempted by conferences like this one. To me, this is the most important issue that faces anyone who cares about the Georgia Basin-Puget Sound, what some call the Salish Sea, and what Sir James Douglas called "this perfect Eden", when he stepped ashore in Garry Oak Meadows ablaze with wildflowers to found Fort Victoria in 1843. This perfect Eden…consider the term. Eden: a place of mythic abundance, a place that exists in the spiritual realm of memory, a place like this one whose great rhythms and life cycles exist outside the artificial human paradigm of nations, states, and borders and politics. Those borders stabilized here barely 150 years ago…dividing nations that occupied this landscape since the time of Abraham, maybe even since the time of that first biblical Eden itself…laying that political template upon ecologies which predated even that.

You know as I set out across the Strait of Georgia this morning, looking towards English Bay and the Spanish Banks, greeted by the same essential view that greeted the crew of the *Saturnina* and the *Discovery* when they first cruised into these waters more than 200 years ago, I couldn't help but compare the perspectives. When Captain George Vancouver first arrived in these waters he was quite incapable, I'm sure, of imagining the megacity that would sprawl from Seattle in the south, to the city that bears his name in the north, and would extend its populous wings right around the Georgia Basin. So that where men and women used to look out into the night and see only the darker bulk of Vancouver Island and the Olympics blocking the horizon stars, now a vast necklace of light drapes the shoreline at every point of the compass. Those lights are not only a signal of progress and the arrival of civilization, they're a signal of impoverishment, of the amassing of wealth through the appropriation of already occupied lands, through the dispossession and marginalization of those former occupants, and through the relentless pillaging of natural resources through the last two centuries.

When Captain Vancouver hove to off English Bay, just over the rise from here, the sea otter trade with China was at its height. Two decades later, the sea otter would be largely extirpated from its range on this coast. Vancouver's logbook on departing from Desolation Sound at the northern end of the Georgia Basin makes special mention of the teeming population of cetacean. So let me quote the entry of that log for July the 13th, 1792: *"Numberless whales, enjoying the season, were playing about the ship in every direction."* Vancouver is telling us that he couldn't look to any degree of the compass without seeing a whale spouting in the Strait of Georgia. Spouts included those of blue whales, humpback

whales, grey whales, pygmy sperm whales, pilot whales, killer whales, and probably even some rare whales that we don't know about. And this abundance sustained local populations.

The Sliammon Band, at what's now Powell River had devised an ingenious method of hunting those whales. They'd fill canoes with clamshells, surround a whale off shallows, like those around Savory Island, and then drop the shells into the water. And as the shells fell, fluttering through the water, they disrupted the whale's eco-location functions and it could be frightened up onto the beach. But the Sliammon level of predation remained low, the abundance of whales remained high and the two had live in an equilibrium of co-existence for millennia. The Sliammon, it might be observed, had not yet encountered what one of my economic professors at management school termed "the inefficiency of being efficient. As western economic principles worship at the shrine of efficiency we have a tendency to accelerate our exploitation of resources until they're exhausted, and then develop new technologies which enable us to move on to exploit new resources; a phenomenon that Roderick Haig-Brown identified and warned about in his prescient essay "*Let them eat Sawdust,"* written almost half a century ago in appealing to us for moderation.

Well, the history of whaling in Georgia Basin serves as a model. When Europeans began taking whales from these waters in the 1860s they quickly industrialized the enterprise with steam engines, harpoon guns, and bomb heads designed to explode in the whale. Within a decade, all but the small and unwanted cetaceans had been extirpated from the range. And this destruction continues in a general sense. Today, even the surviving resident killer whale populations face a precarious future; their traditional food supplies have been reduced by human over harvesting and heedless destruction of spawning and rearing habitat. The whales are contaminated with toxic compounds spewed into the watercourses; and these toxins, I learned, are dispersed through mother's milk and stored in body fat. And some dead whales have been found to be toxic enough to qualify as hazardous waste! In other words, if you try to routinely dispose of the toxic compounds found in a whale carcass at the dump, there would probably be a prosecution under the waste management regulations.

I was thinking of this perverse state of affairs last weekend when I took a break from preparing these remarks to take a stroll through the village of Sidney, just outside Victoria. Sidney's quite proud of its Whale Museum, although in just 10 generations we've gone from the numberless whales of Vancouver's log book, to a couple of pods which seem to dwindle in number every year. A few days before that, I had been up in Campbell River. Driving home down the East Coast of Vancouver Island thoughts about Roderick Haig-Brown writings, and the essence of what it was that the conservation minded men and women of his generation fought to preserve intruded almost everywhere. There were the great scabs of clear cuts across the horizon; there was the highway itself, carving relentlessly through forests, streambeds and whole ecologies that most of the public doesn't see and therefore doesn't think about very much. There was the strip development that reveals the ongoing belief that we have an inexhaustible supply of real estate for development. And there was the absence of big timber; our old growth dry belt Douglas fir has been virtually extirpated. And of the Garry oak meadows that greeted Douglas, that "perfect Eden." they have the misfortune to mostly occur on the sites most desired for residential development. The Garry Oaks that we see may be the last.

Up on the Mallahat I stopped to look over the southern sweep of the Georgia Basin I'd been skirting for more than 150 miles. From up there you can look right across the American Islands to the distant entrances to Puget Sound. Directly below, I looked down on Saanich Inlet, that unique ecosystem that was once so rich in life and a major rearing nursery for salmon. When I was a kid, sports anglers waited impatiently for April; it was spring blueback season…they'd go out and fish for immature coho with a fly. Today it seems a reckless resource…abuse of the resource, but then the abundance was so much that nobody could see an end to it. There's no longer a blueback season in the Sannich Inlet; in fact now the whole Inlet's threatened by the oozing effluent from decaying suburban septic fields. Over on the other side of the Saanich Peninsula is Basin Bay I used to dig butter clams there at the end of the summer when my student loan allotment ran out. Clam chowder and a bottle of a truly vile cheap wine called "Zip"…what my less than impressed girlfriend labeled "vino collapse-o" or "porch climber" (audience laughing)…saw us through many a lean weekend. All those beaches are closed to shellfish harvesting because of contamination.

To the south, Goldstream is still flushing the bits and pieces of last year's chum into the estuary where they will provide nutrients for a new generation of fry. The last time I stopped at Goldstream to talk to one of the volunteer stream keepers about some promising returns from a much-depleted run of chinook salmon, he begged me not to mention the good news. Whenever word got out that there were big chinook in the stream, he explained, poachers would be down to clean them out. So imagine that, we can't even talk about the recovery of a salmon run because there are still people ready to destroy it. Far off to the east, the tawny slopes of Saturna Island rise out of the Haro Strait. This is the outermost and most sparsely populated of British Columbia's outer Gulf Islands. And those burnished grassy slopes that you can see for 50 miles, and their native plants, they're all mowed short by a herd of feral domestic goats.

Beyond that I could see the yellow wall of smog that signals Vancouver, the big smoke, rising maybe 10,000 feet before its plume flattened out. And I wondered where are the chemicals from that smog precipitating? And what are their effects? Beyond Vancouver the great aquifer that lies beneath the Fraser River deltas is increasingly contaminated. Beyond that, beyond the white sentinel of Mount Baker, the radioactive legacy of Hanford creeps with the groundwater toward the Columbia River. What will happen if…when…they interact? Even as I talk here, plans move forward for a natural gas pipeline under Georgia Strait to Vancouver Island. It will come ashore near Mill Bay, just down the shoreline from Cowichan Bay. And the generating plants it serves will put almost a million tons a year of carbon dioxide particulate matter into the atmosphere.

Now the Cowichan River was once one of the most famous fly-fishing streams in the world. It's just down the…just up the beach from where the pipeline will come ashore. It was so famous that the daily catch of anglers was reported in the *New York Times* and the *London Times*. Today the Cowichan has been dammed and channelized with riprap that speeds the flow. Householders strip the repairing cover from the eroding foreshore because they rank the importance of their view above the need to educate themselves about basic river hydrology. To our anglers, Eden is a ruin of what it once was; the magnificent runs of steelhead in tatters. My late father in law, the West Coast writer Arthur Mayes, caught his first salmon in Cowichan Bay right after World War I; it was an 18-pound chinook. He caught it fishing from a dugout canoe he'd bought for ten bucks, trolling a spoon he'd made from a tin can lid. In fact he made most of his lures; my wife's tackle box overflows with his hand carved, hand painted plugs and hand-tied, buck-tailed flies and handmade wobblers. I even caught him once guiltily snipping a tuft of polar bear hide that I had brought back from the Arctic. He… he told me that when the summer run coho came down the coast of Vancouver Island it was something that you heard before you saw. It came as this vast silvery rustle, the sound of fish jumping by the tens of millions. And when those runs came into Cowichan Bay they were like Captain Vancouver's whales; you couldn't look to any point of the compass without seeing a coho in the air.

Now Terry Glaven, whose books about this region and its natural human history are among the best you'll find, has said that coho are so tenacious they'll swim up a wet rope to spawn. Yet, they're virtually an endangered species in many of the watersheds surrounding the Georgia Basin. Householders fill in streams and wetlands; engineers culvert creeks; municipalities divert water; farmers dig ditches; golf course owners strip repairing cover; gas stations dump petroleum products into storm drains; loggers build lousy roads and fill streams with silt; the commercial fishing fleet for years conducted dirty mix stocks harvests that knocked back small runs; anglers went fishing for blue backs. In truth, we're all responsible for these crimes against nature's abundance; crimes for which Roderick Haig-Brown, Arthur Mayes and the other conservationists of their generation simply asked ourselves to hold ourselves accountable.

Well, I've sent the extent of those crimes with my own eyes. When I was a little boy, still capable of simple wonder, I would marvel at the stupendous run of salmon that kept me awake at night, flopping and splashing in the river shallows below my bedroom window. That river and its fish still run through my sleep from time to time. Dreams like the one that resurrect a tall, raw-boned, hatchet-faced man in tweeds and chest waders, working the big pool beneath our house with his long fly rod. While I watched he hooked and landed a big still bright steel head and then he saw me and he waved me over. And he spoke to me with a very sharp British accent, "Ever clean a fish?" he asked. I shook my head. "The first lesson of fishing, clean your own fish…wanna learn how?" I nodded, dumb with awe, as he conned me into cleaning his fish. (audience laughing). He took out a small folding knife, sharpened it carefully on a wet stone and guided me in cleaning the steel head while the winter river hissed by. He showed me how to open the stomach and look at the contents, and showed me the powerful heart and the crimson gills. And then he showed me how to carefully strew the guts on a nearby drift log for a young eagle that was watching from a tree on the other side of the river. I asked him if he was going to catch another fish. "No", he said, "No I got my fish; never take what you don't need." Then he broke down his rod, put the fly back in a battered leather wallet that bulged with other flies, all bright tufts and spiky hackles and shiny sides. And he looked at me kind of sideways, "Do you have any tackle?" I shook my head. He pointed to a log jam on a gravel bar farther upstream. "When the water goes down in the spring you go look at the logs along the upstream side," he said. "There's a big pool up there; you'll find yourself some tackle." Then he gave me that small folding knife as a gift that I never admitted to my parents for fear they'd take it away…but I still have it tucked away in a bottom drawer.

Well I never saw that angler again. I like to think of him as kind of an incarnation of the spirit of stewardship. He turned out to be right about the log jam. I filled my school pencil box with teaspoons and flies I don't recognize and…my dad bought me a small rod and monofilament. So I went out and traded grown up anglers for the big spoons for little ones, and one of those men, a battered old guy with coal dust under his fingernails showed me how to put a little spinner ahead of a wet fly. And with that combination I caught my very first fish from a back eddy below that log jam. It was a 9-inch rainbow trout; I cleaned it the way I'd been taught and I proudly took it home and my mother, who was a wise woman

recognized that this was an historic event in a small life and she immediately stoked up the wood stove in the kitchen and taught me how to pan fry trout in butter right there.

Well how could I have imagined, in those days of bliss, that I was witnessing the passing of Eden? That a pulp mill would come to the mouth of the river; that a thirsty city would suck up the water; that the headwaters would be stripped of their forests; and that the salmon, which seem so inexhaustible, would become a tiny remnant of their abundance? How could I imagine that 50 years later I'd be standing here telling you that for all the warnings and work of Roderick Haig-Brown and the conservation movement, for all the promises of industry and the assurances from government, those runs, like so many other ecological treasures in this Georgia Basin, would be a receding memory. I will confess…I seldom fish anymore. I can't bring myself to find sport in the ruins of what was once so bountiful. But I often think of the lessons I've learned from fishing, from those anglers…and they must all be dead now, those men who shared their knowledge with a little boy. And increasingly I find myself turning not to science but to writers like Roderick Haig-Brown, himself dead for half a century, and Arthur Mayes, dead for a decade; poets of the natural world who, in language as fresh as though it were written yesterday, still give expression to the lessons we ignore at our own peril.

I know that when I tire of the uptight uptown chatter about politics and policy I try to indulge my obsession with wild spaces. I say try because wilderness and what is found there are increasingly under siege. Just beyond the city limits our wilderness dwindles and the ancient forests fall as they have always fallen before the implacable advance of the human tide. Montana writer Richard Manning points out that the grand myth of our time, the one we like to portray on postcards with our tree-lined boulevards and in our public relation campaigns, is that we are a culture that loves its wild forests. In reality, we obliterate them with a ruthless energy; and in cutting the trees, we have no reverence for nature's gift. What reverence can be found in an industrial rhetoric that refers to an 800-year-old tree as a nice stick? Or in salmon…as pieces, as in 30 pieces of silver? Yet if we care to listen as Roderick Haig-Brown and Charles Lalard did, as Terry Glaven and the poet Gary Geddess still do, we can still hear the Earth speaking. It's the language that William Wordsworth calls "a motion and a spirit that impels all thinking things, all objects of thought, and rolls through all things." Nowhere do we sense this with more immediacy than in the vast rhythm of the sea. A rhythm that seeps right into the fabric of one's living. It's the same sea that laid down the cretaceous sediments, of the beaches on the Gulf Islands; and the same salt tide the pulses through the chambers of our hearts and imposes its cadence on the female half of our species.

Just half a century after Captain Vancouver had recorded the wonderful spectacle of a Georgia Basin teeming with life, Chief Seattle is said to have observed that this shared salt blood is what unites us with the Earth and with all the wondrous creatures found on it. Now some literary historians claim that this speech was the invention of a European writer, but I doubt that claim. First, because there's a long tradition of mainstream culture seeking to appropriate the genius that it finds among indigenous peoples. Crazy Horse was said to be the son of a German Prince, because no mere savage could have defeated General Custer; the Mandens were really a lost Welsh tribe because no mere savages could have devised such a civilization; Chief Maquinna was the son of a Spanish castaway because no mere savage could have demonstrated his skills in diplomacy; and of course Chief Seattle's speech must have been written by an American writer because what mere savage could have been so eloquent and displayed such a modern understanding of ecological principles? The second reason for skepticism of the skeptics is because anyone who listens to elders, whether aboriginal or our own, wise people like Hubert Evans or Roderick Haig-Brown, can hear the same images and sentiments expressed quite clearly with the same oratorical rhythm. "We are the children of our landscape," says Laurence Dorell. "It dictates behavior and even thought in the measure in which we are responsive to it."

Despite all our denials, despite insulating ourselves from the natural world in cocoons of concrete, plastic and steel; despite muffling our senses in the electromagnetic fog of our entertainments, the land still lays mysterious claim to us. In unexpected ways it insists on speaking to us out of that same wildness which first engraved the templates of our own human DNA. At levels that we think we have forgotten, we still respond to the arcane languages of wind and moving water, to the whisper of tree tops and to the cry of birds. And yet, except for isolated pockets, the forests in which those winds blow and speak to us have largely disappeared. Can we save any of the remaining old growth Douglas fir around this basin? Less than 2 percent of the ancient forest in this unique ecological niche survives in its original state; what does survive is found only in fragmented stands. One of those fragments is found on Vancouver Island and its named Cathedral Grove, aptly I think. The massive columns, their bows arching so far above the illusive interplay of light and shadow, the benedictions of wind singing through the treetops inspire the same awe which the great gothic cathedrals instilled in their faithful.

As in those cathedrals, such beauty demands of any sensitive observer, a moral judgment as well as an economic one. What are our rights and our obligations here? How much does our duty to the unborn demand that we preserve on their

behalf? Some of us look into this landscape and see only capital inventories awaiting conversion into cash or jobs. And already most of this ancient forest has vanished from the south end of Vancouver Island and around Vancouver and around Seattle. But others around us are reminded of Wendel Barry's observation that what seems economic sanity on the ledger sheet, often proves over the longer run to be ecological madness. As the 21st century begins to unfold we might consider our conduct in this Eden we've inherited in the light of a symbolic warning from one of the hunting peoples of the North Pacific Rim. One of their creation tales, older perhaps than the last ice age, tells of the great mother of the walrus. When greedy human beings broke one of her tusks she retaliated by taking back many of the wild animals—many disappeared forever. If the second tusk should ever be broken by human greed, she will take back all the living things and human kind itself will pass from the Earth.

It's clear from meetings like this one that growing numbers of us see in what remains of these fragmented forest landscapes around us, a tattered but much venerated prayer shawl. We feel a spiritual communion with our human origins and the natural world. If our coastal forests inspire the most intense discussion about preserving wilderness values, rivers are our psychic link to our interior. I've watched chinook salmon in the Fraser River a thousand kilometers from tidewater. I've watched sockeye salmon spawning in the desert, despite our dams and our ditches. Yet day-by-day we improve our power to make changes which seem irreversible. Surely this imposes an even greater responsibility to ensure that whatever we impose in the service of good is reasonable. Or must we destroy the garden in order to live in it?

Many of us feel alienated from the land by urban, industrial and economic forces that seem beyond our control. Yet few indeed are those capable of responding to the wordless, inarticulate language that we hear in the ancient pulse of the sea, in the wind, through the star-embroidered sky, in the thunder of rivers or in an eagle's cry, in the flash of a dolphin or in the molten beauty of a sunrise on Mount Baker or a sunset on Mount Arrowsmith. These images remind of us what is at stake if we fail to shape for ourselves a new role, not as subduers but as stewards of the essential values of the natural world. What kind of past will our children inherit from us? A share in that abundant wilderness that greeted George Vancouver, and that chased Chief Seattle and Roderick Haig-Brown and joined us to preserve? Or just fading memory or someone else's Eden.

Thank you.

David Fraser

Thank you Stephen, it's always a pleasure to…hear you and read your works.

I'd like to thank the advisory committee members, conference advisory committee members. We had approximately 26 agencies on both sides of the border participating in the planning of this, and we also had the privilege of having the Coast Salish First Nation representatives involved in the planning as well. So thank you for that. Also I'd like to thank again our sponsors; 30 sponsors for this event, Canadian and American.

Each day Environment Canada is providing a weather briefing, a daily weather briefing, and we are presenting that during the morning break. And that's available on our plasma screen so feel free to come in and check out the weather. It's going to be sunny and beautiful as it always is in Vancouver.

I encourage you to…partake in the…in the demonstrations that are available in the Coquitlam room on the top floor. There's some wonderful…projects being presented so sign up and get up there and…have a great afternoon

General Session
April 2, 2003

Don Fast
Regional General Director, Environment Canada

OK…we're ready to go? Good morning, *bienvenue,* welcome. This is the third day of the Georgia Basin/Puget Sound Research Conference. I'm Don Fast, the regional general director for Environment Canada for this region, the Pacific and Yukon Region. Environment Canada is a very proud sponsor of this conference. The Georgia Basin/Puget Sound Conference is unique in many ways. It's undoubtedly one of the most important environmental and natural resource science gatherings in this region and it takes a trans-boundary approach to ecosystems research. And we're very delighted to foster this spirit of collaboration across the border, to support the exchange of science and information between our countries.

And on behalf of the Government of Canada, I have the pleasure of introducing the Honorable David Anderson this morning. He has the distinction of being the longest serving Minister of the Environment, and I've had the pleasure of working with him the last three years, and I can also tell you he is one of the most knowledgeable ministers I've ever worked with. As many of you know, Minister Anderson is also the Member of Parliament for Victoria, British Columbia's capital city. And it's just about the mid point of the Georgia Basin/Puget Sound study area.

This morning Minister Anderson will speak to us on activities under way in the Georgia Basin and also on several initiatives from the Government of Canada. I know the minister has been very much looking forward to addressing you this morning…please join me in welcoming the Honorable David Anderson.

▶The Honorable David Anderson
Minister of the Environment

Good morning. It is indeed a pleasure to see so many of you here.

It is unfortunate Governor Locke was unable to be in Vancouver in person today, but thanks to technology, we are happy to have what you might call the digital version of the Governor with us. Governor Locke and I have worked together on numerous occasions over the years, and at the risk of sounding immodest, I'd say we've managed to do some good things.

I am honored to say that Governor Locke and I have shared, and continue to share, a close friendship, going all the way back to my time as Minister of Fisheries and Oceans, and the historic decision to halt Canadian fishing in order to protect American salmon stocks.

For those of you from out-of-town, welcome! And a special welcome to our American visitors. Our countries have had a long history together, both as neighbours and as friends.

Indeed, it's difficult to imagine two countries more closely tied together—literally and figuratively. Everything from our electricity grids and gas pipelines to our railways and air traffic control systems are tied together. We enjoy the biggest two-way trading relationship in the world, worth more than $600 billion a year.

We are the biggest supplier of energy to the U.S., and the U.S. is our biggest energy customer.

The interdependence is not only economic. We both understand the need to cooperate in many, many other areas, including security. That is why our two governments are working to build a "smart border"—a border that's closed to criminals and terrorists, but open to the legitimate commerce so vital to both our economies.

And then there's just plain friendship: Canada is one of America's favorite travel destinations, and generations of Canadians have been heading to Hawaii, California, Arizona and—well, just about anywhere to get away from the snow for a couple of weeks!

While you are our guests, I hope you'll find the time to discover some of the many attractions that make Vancouver such a great city. The natural beauty found in and around Canada's third largest city, gives Vancouver many competitive economic advantages. A recent global study of 200 cities found that Vancouver placed second after Zurich and tied with Vienna in terms of the best quality of life and safety. It just goes to show that a healthy environment is integral to a healthy economy!

I would like to take a moment to thank and congratulate the conference organizers for putting an outstanding program together. The breadth and scope of issues being discussed speaks to the dedication and motivation we all share in ensuring the sustainability of the Georgia Basin-Puget Sound ecosystem. This event is a welcome opportunity to share ideas and findings within the context of diversity, science, and collaboration.

Without a doubt, the long-term impact of collaborative efforts is far greater than those undertaken in isolation.

It is frequently said that when it comes to the environment, one should "think globally, act locally." If I may, I'd like to add to that, and say that we also need to plan regionally.

These efforts will help to better ensure a clean and healthy environment within our shared ecosystem. I firmly believe that our environment must be dealt with on a holistic basis. We must look at the warnings of environmental problems and unchecked development in a holistic way and not just in terms of each individual problem on its own. We must be pro-active about envisioning the type of world in which we, and the generations that will follow us, want to live 10 years from now, 50 years from now, a hundred years from now. And then we need to work backwards from the future to establish the steps that must be taken in order to get us there.

I want to take a moment to share with you some of the recent Canadian environmental successes with respect to collaboration and public participation.

Last fall was historic. The Canadian Species at Risk Act received parliamentary approval and Royal Assent, and will be proclaimed into law later this year. And on the same day, within one hour of each other, Parliament approved Canada's ratification of the Kyoto Protocol.

Reaching these environmental milestones has required an extraordinary commitment of time, effort and talent of many people. It also involved extensive and complex discussions and negotiations with a broad and diverse group of stakeholders—provincial, territorial and municipal governments, aboriginal peoples, non-governmental organizations, farmers, ranchers, fishers, industry representatives, and other interested Canadians.

It has been said many times, and it is no less true for it: climate change is a global problem. But it is a global problem with regional opportunities for mitigation. We've already seen some outstanding regional successes—Microsoft and Ballard Power are just two examples of the intellectual ferment that exists in our region.

While this conference is clearly about collaboration, partnerships and joint endeavours, I would like to briefly focus on the commitment Environment Canada has to science. Environment Canada's strength is its people; it is home to scientists from a tremendous breadth of academic and professional backgrounds—a scientific cadre that is second to none. We produce world-class scientific research and are among the most active organizations in Canada when it comes to monitoring the various aspects of our environment. When we partner with others in the scientific and academic communities, we can, and do, achieve a great deal. As scientists, your role cannot be understated nor undervalued.

The Species at Risk Act (or SARA) and our actions on climate change are complementary initiatives. Climate change affects the habitats and waters that support species; actions on climate change protect species and their habitats.

As we move toward implementation of the Species at Risk Act, and the pursuit of our Kyoto objectives, the true breadth of these achievements will become visible—on the ground, in the water, and in the air.

Over the past five years, the Georgia Basin Ecosystem Initiative, or GBEI as it is often referred to, has taken action on a number of key environmental issues in the Basin. Recognizing the environmental stresses arising from growth, our priorities have centered on the conservation and protection of habitats and species, achieving cleaner air and water, and more sustainable communities.

In July, we will be releasing our "Five Year Perspective" report that will provide an overview of the actions taken and results achieved through the Georgia Basin Ecosystem Initiative partnerships since 1998.

The GBEI has worked through conservation partnerships, local planning processes, stewardship approaches, and has participated in collaborations with First Nations to protect and conserve our environment. Its successes over the past five years include:

- The acquisition, protection and/or restoration of sensitive habitats.
- Inventories of sensitive ecosystems.
- Support to community-based efforts to clean up polluted shellfish areas.
- The establishment of transboundary mechanisms to better manage air quality in the region.
- An international study on air quality in the basin, providing research on the source of the haze that tends to envelop many areas of the lower mainland.
- The development and implementation of best practices for land.
- Management and urban development to minimize harm to the environment.

There is a very recent success story I want to share with you—and it is about the permanent protection of Laughlin Lake. Environment Canada, through the Georgia Basin Ecosystem Initiative, provided the final $63,115 required to protect Laughlin Lake on Galiano Island. This contribution concluded a joint $165,000 fundraising effort by Galiano Conservancy Association, Habitat Acquisition Trust, and the Islands Trust Fund.

I congratulate them and am very pleased that the GBEI could participate in this acquisition. Laughlin Lake is one of the few lakes in the region that has no human development along its shores. Several species at risk make Laughlin Lake their home and are dependent on its continued existence. The 11-hectare (27-acre) property provides essential habitat for an abundant and diverse population of birds, mammals and amphibians. The lake is the largest body of freshwater on Galiano Island.

Many of the projects under GBEI have been pilot projects, and can be emulated throughout the Basin and across the border to achieve even greater results.

I am pleased to report that these efforts will continue, as we prepare to launch the next phase of collaborative work through, what we have named the Georgia Basin Action Plan. And, I am pleased to announce that we are working to involve even more partners in this endeavour. Over the next five years, $22.5 million dollars will be allocated by Environment Canada to ensure that the Georgia Basin Action Plan has the capacity to meet its objectives and priorities. In addition to this funding, the department will contribute an additional $8-10 million dollars over the same five-year period—primarily through science work and coordination of the Action Plan.

Building on the now completed five-year Georgia Basin Ecosystem Initiative, in partnership with Fisheries and Oceans Canada, Parks Canada, and the B.C. Ministries of Water, Land and Air Protection, and Sustainable Resource Management, Environment Canada will be collaborating to:

- One, support the development of science, tools and knowledge to improve land and resource use decisions.
- Two, improve accessibility to ecosystem data and information.
- Three, advance the development of ecosystem indicators to inform
- Decision-making within governments and civil society.
- Four, continue efforts to take or support direct action for the conservation, protection and restoration of damaged or at-risk areas of the ecosystem.

A "Framework for Collaboration" has been agreed to by the partners to guide the development and finalization of an action plan over the next few months.

Your work across various scientific disciplines and environmental issues will advance the scientific understanding of our shared ecosystem and support improved decision-making to ensure greater ecosystem sustainability and recovery.

Our citizens want to know more about scientific research, how it affects their lives and what it will mean for their children. They want to know how science is being applied now and in the future. They are curious about what your work tells them about their health and many other aspects of their quality of life.

Regular reporting on environmental issues and research helps to inform people of the environmental challenges we are facing and the progress we are making to address them. The challenge is to integrate this information into our decision-making—when we make economic choices, when we make urban planning choices and when we make conservation choices.

Environmental indicator programs are in place throughout Canada and the world. But we need to improve our ability to evaluate the effectiveness of current measures, to design responsible and effective environmental policies and programs, and to ensure that investments are used as wisely as possible.

Canada's National Round Table on the Environment and the Economy (NRTEE) will soon report on their work to identify a core set of environmental and social indicators to supplement the economic indicators with which we are familiar. And the government is continuing its work towards the establishment of a comprehensive environmental information system for Canada as recommended by the Canadian Information System for the Environment (CISE) Task Force in October 2001.

Today, I am releasing two new reports that form an important part of the government's commitment to strengthening our approach to the management and sharing of environmental information. *Environmental Signals: Headline Indicators* and its companion document *Environmental Signals: Canada's National Environmental Indicator Series.* These reports enable the Government, with its partners and stakeholders, to make solid, evidence-based decisions on issues that affect the health of Canadians and their environment.

The reports will provide Canadians with an objective, understandable snapshot or "check-up" of where we stand in key areas of environmental quality and preservation. And most importantly, the reports make up part of the environmental information that Canadians need to make decisions supporting sustainable development in the home and in the workplace.

While these reports are important accomplishments, future reports will be timelier, better targeted, and have even more useable indicators of our environment. We will be able to strengthen the basis for sound and effective public policy on the environment and provide a foundation for holding governments accountable for these policies.

Many of you understand the need to identify, track and manage environmental change. You are in an excellent position to improve public awareness of science-related issues and to inspire young people with an interest in science. Your work and that of your colleagues has created extraordinary benefits for society.

Here in British Columbia, science can help to properly guide policy-making for the issue of offshore oil and gas.

In Canada, air and water quality, the conservation of biological diversity, climate change, and creating and maintaining natural legacies are quality of life issues that are driving the environmental agenda.

In response, Canada has initiated a number of actions. In addition to the new Species at Risk Act and the ratification of the Kyoto Protocol, we have, in collaboration with our provincial and territorial partners and in consultation with industries, landowners, communities and other groups, developed Canada's Stewardship Agenda. Its vision is that of "a nation where Canadians are actively working together to sustain our natural life-support systems."

The scope of the agenda reflects this vision, promotes collaborative action, and builds social cohesion and shared responsibility among citizens. In particular, it engages those who are involved in the conservation of biodiversity, the sustainable use of Canada's biological resources and the wise management of all natural resources.

Stewardship is an essential part of the cooperative approach. Bringing together landowners, conservationists, aboriginal peoples, governments and other partners to protect species and habitat, stewardship is the first response to critical habitat protection under the Species at Risk Act.

Implementing our Species at Risk program will require us to use an ecosystem-landscape approach as much as possible. The collaborative efforts being undertaken in the Georgia Basin incorporates this approach, and will be one of the mechanisms through which actions to protect species at risk are delivered.

While Environment Canada is working to create and implement science-based solutions, we cannot achieve this goal alone. Here in British Columbia, we are working collaboratively with many federal departments, including Fisheries and Oceans Canada and the Parks Canada Agency, and with provincial ministries responsible for the environment and resource management. We are also working in partnership with the Environmental Protection Agency and with senior American representatives.

In that spirit, I am pleased to note that, working under the auspices of the Canada-BC Pacific Marine Heritage Legacy Program, the governments of Canada and British Columbia have agreed to the establishment of a national park reserve in the southern Gulf Islands. Both governments have also agreed to conduct a feasibility study for a national marine conservation area that would be contiguous with the new national park.

This area is a key portion of the Strait of Georgia Lowlands—one of the last remaining natural regions in southern Canada not yet represented in Canada's national parks system. The Gulf Islands National Park Reserve is expected to be announced in the near future.

Last month, my colleague, the Minister of Fisheries and Oceans, announced the establishment of Canada's first Marine Protected Area, the Endeavour Hydrothermal Vents Area.

Marine Protected Area is an area of the ocean designated for special management measures under Canada's Oceans Act. The designation puts in place enforceable regulations to protect the area and its marine organisms while encouraging continued scientific study and research of the unique ecosystem.

The Endeavour Hydrothermal Vents Area lies in water over 2,000 metres below the surface of the Pacific Ocean. The area is home to 12 species of marine life that do not exist anywhere else in the world, and are also home to 60 distinct species native to the Juan de Fuca Ridge system.

This is the first Marine Protected Area to be announced. Another proposed Marine Protected Area is Race Rocks, about 17 kilometres southwest of Victoria, at the eastern end of the Strait of Juan de Fuca. There will be many more to come as a number of areas are under consideration throughout the Atlantic, Pacific and Arctic Oceans; areas that are home to local resources requiring conservation and assurance of sustainability.

These actions demonstrate the Government of Canada's commitment to protecting our environment—and working with partners to make it happen.

Our transboundary collaboration with Washington State has already helped to improve ecosystem health in the Georgia Basin/Puget Sound region, and we look forward to building on those initiatives and successes.

Our first ever transboundary indicators report, the *Georgia Basin-Puget Sound Ecosystems Indicators Report, the Semiahmoo Bay-Drayton Harbour Shared Waters Project, the Georgia Basin-Puget Sound International Airshed Strategy,* and this conference, are but a few examples of our cross-border accomplishments under the auspices of the Georgia Basin Ecosystem Initiative. They are outstanding examples of a partnership-based approach.

The challenges that bring us together today transcend jurisdictional boundaries. One of our greatest challenges in the region is our growing population. In 1960, 2.6 million people lived in the Georgia Basin/Puget Sound Ecosystem. Today approximately 7 million live in the area—with 4 million in the United States and about 3 million in Canada. Projections are that by 2020 we may add another 3 to 5 million.

These challenges of rapid growth are made even more complicated by the extremely complex and difficult geography. Despite its large geographic area, the area available for urban development in British Columbia's Georgia Basin is limited to less than 5 percent of its overall area when the parks and wilderness areas, ocean and agricultural areas, and mountain ranges are taken into consideration.

The way growth and distribution of population are managed throughout the Georgia Basin-Puget Sound ecosystem, providing both the greatest challenge, and the greatest opportunity for the protection, conservation and restoration of the ecosystem.

Since re-election in November 2000, the Government of Canada has set up the Task Force on Urban Issues, chaired by Member of Parliament Judy Sgro, to figure out how the federal government could play the most positive role. The Task Force's guiding principle is that the government should have an "urban lens" in its decisions that affect urban areas.

Our growing challenge will be to reconcile our complex urban systems into their larger ecosystems. It will be to reduce the ecological footprint of urbanites and suburbanites. The way in which Vancouver and Seattle develop, whether sprawling further or becoming more transit oriented, will directly affect air quality, conservation of land and biodiversity, energy needs and the impact on climate.

Our environmental responsibility extends not only to the descendants of those who live in the region today—our children, our grandchildren—but also to the influx of people who will come to settle in this region and their descendants as well.

Through years of working together on managing the Georgia Basin-Puget Sound ecosystems have provided us with valuable lessons that are useful in better coordinating our management of the main human habitat, namely our metropolitan centres.

The importance of partnerships, of collaboration and of communicating cannot be overstated. Canada is proud to co-host this conference. We share the common goal of protecting and improving our ecosystems, and working in collaboration with partners to ensure the betterment shared resources. It is our desire that this first joint conference serve as the foundation for similar initiatives in the transboundary ecosystem, and serve as a model for collaborative efforts in other geographic areas.

As the conference program attests, there is much to be said with respect to the environment. Thanks to your interest, scientific expertise and traditional understanding of the issues, we are that much closer to sustainability.

While there is now, more than ever, more public momentum and desire to obtain the "sustainable community," there is also, no doubt, that as individuals, as members of our shared ecosystem and as members of our communities, we must all strive to do more to help our ecology remain vibrant and viable, and our economy more diverse and innovative.

I am confident that the partnership between the Puget Sound Water Quality Action Team and the newly launched Georgia Basin Action Plan will serve as a catalyst in this regard. I wish you continued success in your endeavours.

Thank you.

Tom Fitzsimmons

Washington State Department of Ecology

Good Morning…I'm Tom Fitzsimmons. I'm here to introduce Governor Gary Locke to you. I'm the director of the Washington State Department of Ecology. And before I do my introductions…let me thank you Minister Anderson for incredibly setting the tone of the range of activities that our two Governments are collaborating on. I've heard Governor Locke many times speak very fondly of his work with you on the Pacific Salmon Trade Treaty. He tells it a little bit differently than you in the sense that he credits you with doing all of the work. I'll take back and try and disavow him of that notion from your remarks this morning, but I think the real point…of the two memories fondly on a collaborative effort is the that collaboration brings incredible successes when our two countries pair up. I think crediting one more than the other is really a true statement of true partnership and true collaboration.

There are few people in this business that have been in it with the tenacity and the vision as long as you, Minister Anderson. So in addition to the round of applause for your great remarks, let me ask everybody in this room to thank you for your leadership, both historically and into the future. Thank you very much (leading audience in applause).

I have the honor and the privilege and the responsibility of introducing Governor Gary Locke to you. I've undoubtedly done it many, many times before…but I've never done it to a video that you're about to see. So it's a little different for me to do this…and I imagine it's a little different for you too…in this day and age of video and conferences of this magnitude people perhaps draw some inferences from the fact that the Governor of the State of Washington is here on video as opposed to the Minister here in person…not to be competitive at all. So it's a little odd for me; it'll be a little different for you.

One thing that you can take from this… trite is it might be is that in Washington state when the Governor is introduced usually people stand up in the room. So, you don't need to stand when the video starts, how's that?

Let me tell you though that while he's here on a video you're about to see, he is unquestionably in this room in person. He's here in the policies of Washington state; he's here in his dedication and leadership for environmental activities; he's here in his collaborative work as just talked about; and most of all he's here in his commitments to the environment of the combination of the landscape of British Columbia and Washington state. I know that to be true because I have personally experienced it on numerous occasions where he could have compromised that environment, those goals, those policies… and he chose not to. He chose to support my agency, the natural resource agencies, in the state of Washington.

So just to help you get your head into the difference between video and here in person, just think of him in this room in his policies and in his commitment and in his leadership.

So with that been said…and a button I think I need to push here, let me introduce to you Governor Gary Locke, the Governor of the State of Washington.

▶Governor Gary Locke (via video)

State of Washington

Good Morning, I'm Gary Locke, Governor of Washington State, and I'm sorry that I can't join you in person. I'm also disappointed that I won't be able to hear Minister Anderson's comments. During this key point in our legislative session, duty calls at Olympia, our state Capital, but I am well represented by Brad Ack, my new chair of the Puget Sound Action Team and Tom Fitzsimmons, the director of the Washington State Department of Ecology, along with many highly talented and dedicated Washington state employees. I appreciate the opportunity to add my welcome and thanks to those gathered in Vancouver for the Georgia Basin/Puget Sound Research Conference.

This conference will help us all manage our activities in this shared basin. I'm also very pleased by our international cooperation on transboundary environmental issues. This includes establishing the Environmental Cooperation Council and the British Columbia/United States Oil Spill Task Force. We must continue to strengthen this relationship as we work to solve our complex environmental problems. We will also work in cooperation with the First Nations and Washington State Tribes, all levels of Government and the business and environmental communities. We're committed to the recovery of the orcas that grace our shared waters and we need a coordinated recovery plan for Canada and the United States involving state, provincial and federal agencies.

We're also fortunate to have such a vibrant commercial shipping industry in the Puget Sound and Georgia Basin, but we must protect against the accidents that could cause major spills of oil and other toxic materials. Washington State is working hard with the shipping industry to fund a permanent tug at Neah Bay, at the entrance to the Strait of Juan de Fuca. And we hope to work closely with our Canadian counterparts on this issue. We also continue to see declines in populations of marine birds that call the Georgia Basin/Puget Sound region home. We still don't understand the causes of these declines, but we need better answers through cooperative research efforts.

Washington State looks forward to continuing to work closely and cooperatively with our Canadian neighbors to accomplish our conservation and recovery goals. Congratulations to Environment Canada, the Puget Sound Action Team and the many other sponsors for the impressive agenda for this conference. I thank you all for attending this important event and for your dedication to this effort.

David Fraser

Well thank you Governor Locke, wherever you may be right now. Minister Anderson, thank you, Tom Fitzsimmons, Don Fast…thank you very much. I have the rather mundane responsibility at this point to close off this session and provide you with a few program notes.

First of all…perhaps…or very importantly anyway, I would ask those who are evaluating the student's presentations to do your duty and fill out the forms and put those in the box at the registration desk. I would also ask the session chairs who are filling out the reporting templates for our wrap up on Thursday, to also complete your forms and hand those in to the registration desk.

Minister Anderson made note of a couple of documents… "Environmental Signals" document, *The Georgia Basin/Puget Sound Ecosystem Indicators Report* and *The Georgia Basin Action Plan: Framework for Collaboration,* and these are available in the foyer in the Environment Canada booth and in other areas. With respect to *The Environmental Signals Report*…Dr. Risa Smith will be giving a presentation and a discussion…lead a discussion forum from 3:15 to 4:00 this afternoon in Salon 2…that's upstairs.

Session 6D this afternoon, there will be some minor changes. Paul Waddel, panelist, has had to cancel…unfortunately, however, Cinde Donoghue and a presentation by Stanley and Susan Grigsby will be added to that session…6D.

I encourage you to take part in our weather briefing that will be provided here during coffee break and…as I said yesterday, it's a beautiful day here in Vancouver as usual. And lastly, our sessions start at 10:30 so enjoy your coffees and enjoy the rest of your conference. Thank you.

Luncheon Session
April 2, 2003

Gord Macatee
Deputy Minister of Water, Land and Air Protection for British Columbia

Could I ask for everyone's attention? It's truly amazing; it's just like being at boy scouts where you hold your hand up and everybody stops talking…so thank you. My name is Gord Macatee. I'm Deputy Minister of the Ministry of Water, Land and Air Protection for British Columbia and it's my pleasure to introduce our lunch speaker…the Honorable Joyce Murray, Minister of Water, Land and Air Protection.

Minister Murray is truly an environmental innovator in her own right. She has an MBA from Simon Fraser University and in 1992 wrote a thesis on the subject of climate change and public policy. She's co-founder of Brinkman and Associates Reforestation Unlimited and has been operating a business doing reforestation work…across Canada and into Central America over a number of years. She represents the constituency of New Westminster…close to the mouth of the Fraser River.

For the Minister, the Georgia Basin/Puget Sound Research Conference is a truly important learning and sharing opportunity. It's…scientists getting together to share information and to discuss sustainability on our shared ecosystems. And at the same time the B.C./Washington economic…or Environmental Cooperation Council is meeting upstairs to discuss how we can work together at state, provincial and federal levels as we tackle shared challenges and deal with opportunities to work together. We gain a great deal from these proceedings and these opportunities to work together, and we truly appreciate you…bringing your thoughts and words of inspiration today.

So please welcome Minister Murray.

▶Honorable Joyce Murray
Minister of Water, Land and Air Protection for British Columbia

Well I'm very pleased to be here today as a Georgia Basin resident, as a member of the B.C. Government and as a tree planter. And…thank you for the introduction, Gord. It's amazing to see so many people; to me this reflects the great depth and breadth of talent and of commitment to the issue of environmental sustainability in this region. On behalf of our premier and government in Victoria, I especially want to welcome our American friends and colleagues to the conference and I understand that almost half of the people in the room come from south of the border. So…welcome those of you who are here to attend the Georgia Basin Ecosystem Initiative aspect of the events and also for the bi-annual meeting of the British Columbia/Washington State Environmental Cooperation Council. And I feel very privileged to be invited to be here to today to join the Honorable David Anderson and other leaders of state and…national governments.

Actually 29 years ago is when I first was up on the coast of British Columbia planting trees and it was a wonderful introduction to our environment and British Columbia and the Pacific Northwest, and what it takes to restore the environment. Since then my path has taken a few different directions as the introduction mentioned and…it's a privilege to be here at the podium, but I almost wish I could be spending the two days in the workshops with the people in the room because what is happening through these initiatives is innovative and it's exciting. It's leading edge and I would love the privilege to be able to sit and be part of those discussions. However, instead, I'll give comments about our province's approach and some of the initiatives that we're doing these days that are in alignment with the initiatives in the room.

Our government was elected on the promise of building a new era of hope and prosperity in public service in British Columbia. And in the February "State of the Province" address, the premier stated very clearly that environmental sustainability is a critical part of the social and economic future of British Columbia. That will be factored into, and is being factored into, the changes that we're making to improve people's lives in this province. We're opening the economy to new investment and job creation based on lands and resources. We're opening new opportunities for learning and for providing quality accessible patient care for British Columbians. We're opening new partnerships with First Nations and we have some very exciting initiatives on that level. Partnerships with other governments and with private

enterprise; and we're revitalizing our forest industry to put it on a sound competitive footing but also an environmentally sustainable footing. We're opening up B.C. to the world through our bid to host the 2010 Olympic Games, and I am an enthusiastic supporter of those games for many reasons, not the least of which, they will be the most environmentally sustainable Games that have ever been seen on the planet and I know a number of you in the room are excited about some of the initiatives that support that and that those sustainable games will support.

So we're already well underway as a government, 21 months since being elected, to making progress toward our goals and on making progress in all sectors of the economy and all regions of the province. All of the ministers and all of the ministries have been asked by the premier to reflect the commitment to environmental sustainability and I have the privilege of…as the minister of Water, Land and Air Protection, to have a special responsibility to show leadership in that regard. I see my ministry as being charged with the role of supporting government succeeding in its range of objectives, including economic and social as well as environmental. We protect the unparalleled quality of life that the people of British Columbia enjoy and that's a quality of life that makes this the best place in the world to work, to live, to study. We set strong environmental standards and ensure they're enforced. Our work gives the public confidence that the natural environment is being protected, and it gives businesses the certainty that they can operate on the level playing field that they need to prosper.

Our ministry also helps assure our customers and markets around the world that we do business in an environmentally responsible and sustainable way. And that supports exports and jobs in our province heartlands that are so important to us. And fourthly, we support economic activity directly by providing outdoor recreation opportunities like hunting, angling, wildlife viewing and the enjoyment of our incredible parks system. We also provide economic opportunities through some of the product stewardship programs through which entrepreneurs in the recycling industry or environmental technology sectors serve the public good.

So over and over we hear from British Columbians that they want a strong economy that produces jobs for them and for their children. They want social stability, they want access to vital public services and they also want an environment that's cleaner, healthier and safer. So I believe these objectives are attainable; they are not mutually exclusive. The government's responsibility is to participate and lead where possible in finding ways to make that real and I know that's what people—you in the room—are working towards as well.

In our ministry we're committed to a principle approach to environmental stewardship, where our ministry sets standards and outcomes and applies penalties if they're not respected. And I would like to take a moment to talk about some of those principles and how they're reflected in the decisions we make and the actions we take.

Our approach to environmental stewardship is results based; so we'll establish the desired outcomes and frameworks, but we won't dictate exactly how our partners in business and municipal government and our stakeholders will achieve those results.

Our approach is science based; so independent and expert advice is sought such as was prepared by our Grizzly Bear scientific panel, as well as the work that our scientists do everyday.

Our approach is based on a desire to make decisions in the public interest and not the special interest, and that's why our recreation stewardship view panel, for example, talked with dozens of provincial organizations representing hundreds of thousands of British Columbians and we then put some of those changes that were recommended into our new model.

Our approach is based on building partnerships and bringing people together to protect the environment. And that's reflected in some of the species recovery plans that our ministry staff are working with partners to develop.

Our approach is based upon accessible and transparent information; we want people to know the challenges we face and to help us find solutions. And so for much of the policy, discussions and changes that we're bringing about…we have information and papers posted on our website for people to provide comment as well as formal and informal consultations. Our ministry also published recently the "2002 Environmental Trends Report" and our province is a leader in that kind of commitment to information and to making information available that people can base their decisions and their actions on.

So with that approach in mind I wanted to touch bases a bit more on the Georgia Basin Action Plan and the important work that the people in this room are doing to ensure the kind of future that we're looking for…for our families in these

regions. So I just want to go back and thank the government of Canada and Minister Anderson as the representative for your commitment to the Georgia Basin Action Plan. I understand that you made an announcement this morning of a very significant five-year commitment to this Action Plan, so that is very worthwhile and greatly appreciated by many of us. Canada is a steadfast partner in environmental protection in Canada and in British Columbia, and I must say that a partner that brings a large check is very, very welcome.

In the past 25 years, the population in the Georgia Basin area has more than doubled and I understand that it is expected to reach four million in Canada and in excess of five million in the Puget Sound Region. And that is of course why we focus on the Georgia Basin Region and the Puget Sound/Georgia Basin partnership—to address those pressures and make sure that we actually reduce our footprint on the environment rather than increasing it as our population increases. States and provinces government levels are charged with implementing many of the initiatives that we will need to reduce the impacts on the environment.

Airsheds, watersheds, animals, fish don't know about national and provincial borders and so we need to work together to get the kind of results that we're all looking for. We need to share information in order to be effective, and we're most effective when we coordinate our actions. And that's what the initiatives that people are here today working on are all about. The focus on a regional and watershed approach is more and more becoming the way to solve these problems and solve them together. One of the things that a regional approach does is provide tools and provide motivation for local communities, because I'm a strong believer that the action needs to happen at the local level as well as the other levels. And my own community of New Westminster is an example of a community that's becoming inspired to think about these issues, and I understand that there was a presentation here yesterday afternoon of a project that had been funded by the Ministry of Community, Aboriginal and Women's Services to develop local sustainability indicator reports. So I've been very pleased to see that kind of leadership from New Westminster as well.

So the Georgia Basin Ecosystem Initiative has been a pioneer initiative in evolving our ability to live sustainability… and…actually…it must have been five years ago, before I was considering this change of career into running for office, I was quite intrigued by the Georgia Basin Ecosystem Initiative. I remember having read about it and having downloaded some stuff from the internet to find out what it was all about. It was this $5-million project; I remember John Robinson had a leadership role and there was some thick document that expressed…the vision and the goals for that project. And I read through it and wondered if there was a role for me in the initiative itself. I ended up getting side tracked with other things and didn't follow through with that, but I've since then taken an active interest in the initiative and do want to acknowledge the people that have done the work, created the success, so the initiative is now being followed with the action plan for which the funding was announced today.

So I would guess that in this room we share a common vision of a sustainable future for the basins on both sides of the border. I know that the people in the room today, whether you're students or whether you're cabinet ministers, are catalysts for change and you're leaders of change. So I want to acknowledge you as the explorers, finding new roots to protect and restore environmental health while providing sustainable economic opportunities that support the social well being that we also value.

I'm going to just mention a few initiatives that the province is undertaking that connect in with the work that you're doing and the goals that you have for a healthier environment in the Georgia Basin.

I'm pleased to announce today that the Government of British Columbia is making an additional contribution of over $500,000 to the Habitat Conservation Trust Fund in support of the Georgia Basin Steelhead Recovery Program. That is a very important recovery strategy; it was completed recently and it prioritizes specific watersheds for specific actions like the restoration of freshwater rearing capacity. This one-time grant is a fiscal dividend that actually shows how sound fiscal management can benefit and improve our environment.

Some of the positive initiatives that we're working with that support sustainability goals in the Georgia Basin area include The Pacific Marine Heritage Legacy. Now that's an agreement that's based on negotiations between the government of Canada and British Columbia from the mid 90s that, when we were elected, we revitalized and signed an additional commitment to. I'm optimistic that this year these plans will come to fruition because what they do is they provide a substantial financial commitment, $25 million on the province's side and I believe…$30 million dollars total on Canada's side, to create national and provincial parks on the southern Gulf Islands where we have some fragile land and very important ecosystems.

I was very pleased that the province was able to make this $25-million funding commitment to parks; it was especially significant at a time of major, major economic challenge that we faced as a government when we were elected. So…20 million of that dollars is being used to purchase private lands to enhance the parks system on Islands such as Salt Spring, Valdez, Galliano and Savery. And this parks program, this agreement with Canada includes a sizeable financial commitment by both the federal and provincial governments to partner in the purchase and protection of Burns Bog, which is also a very valuable and unique and worthy of protection ecosystem that we have the privilege of being the stewards of in British Columbia. So we maintain our commitment to that project; I have no news to announce on it; negotiations are still under way…but we're determined as a government to be able to announce success on that at some point in the future.

Now about a week and a half ago I was in a room with about roughly this number of people and that was in Kyoto and the Third World Water Forum, which wasa very interesting and, I think, valuable exercise in sharing information and commitments around protection of water, which as the minister mentioned to me over lunch, will be one of the two top environmental issues over the coming century. My premier believes quite strongly that if you take care of water and you have clean, healthy water ecosystems you're doing a big part in taking care of the environment. So water is a very high priority for us, and I was pleased to have the privilege to represent the Canadian Provinces and…Canada and the Territories and the president of the Canadian Council of Ministers of the Environment, in Kyoto. That forum did highlight the cooperation that's needed across levels of government, civil society, non governmental organizations.

What really struck home to me was that I was in a room of people that were grappling with these issues that were so common, whether it was British Columbia or New Zealand or Romania…we had the same kinds of challenges. And one of the things that struck me was how privileged we are in Canada to be doing cross-border work with a country like the United States. The level of cooperation, the level of common intent, the goodwill that we have is so important to getting results. At the conference there was, of course, an intent to cooperate but there were many cross-border issues around watersheds and watershed protection that were far more problematic. So we have a privilege of having a kind of relationship that will allow us, that will allow you to achieve results.

And protecting drinking water and protecting water quality is a top priority for our government; which is why within months of being elected, the minister of Health Services and I had appointed a panel to review safe drinking water issues, and actually the panel chair is in the room with us today—David Marshall. And the panel came up with some very valuable and very comprehensive recommendations, which became our Drinking Water Action Plan that will be accompanied by groundwater regulations that my ministry is working on now, and I hope we will no longer have ground water experts calling British Columbia the Wild West…once we get those regulations in place.

And another area of leadership that British Columbia enjoys, and I would like to see it continue, is in the area of product stewardship. I think we have some very advanced product stewardship programs that have been models for other jurisdictions, and I intend to continue the development and improve our product stewardship and recycling efforts. We need to focus on the things that have the highest toxicity in the environment. I was very happy to announce Lubricating Oil End of Life Stewardship Program recently that will be pulling over 18-million liters, that's a supertanker full, of used oil that has been going into the environment. We'll be pulling it into the recycling facilities for reuse. I think that kind of initiative is very positive for creating business opportunities, protecting the environment…supported right across the board and I like that kind of solution that more and more our government staff, our scientists, non-profit groups and partners are, are creating.

British Columbia will shortly introduce in the Legislature, revisions to our Waste Management Act and Environmental Management Act. Now this is a major piece of pollution management law that has been in place for a number of decades and I believe it hasn't…it doesn't represent today's set of connections between the waste, the flows of material and energy into the environment…pollution impacts and human and environmental health. So we will be updating that Legislation.

I intend that we be on the leading edge of environmental management in North America, through the amendments. We'll be enabling a range of innovate tools and approaches that include area-based environmental management, which really is what the Georgia Basin Ecosystem initiative and the cross-border cooperation councils are all about. So let's take those good ideas, let's take those theories and those practical applications and make sure the laws support them. That's the intent with these…with these amendments. We will be focusing our effort where it will be the most effective so that we can actually achieve our objectives of maintaining a safe and healthy environment and building a robust economy in the Georgia Basin region as in the rest of the province.

So you are the people with the vision; you're the ones that have the dedication; you're the ones that are doing the hard work. And whether you're a government person, a staff scientist, a student, a politician or a business leader, I want to thank you for your contributions to this shared journey and I want to invite you to enjoy the rest of the conference.

Thank you.

Pete Dowdy

Thank you Minister Murray, I'm very glad you could join us today…and I also support the Vancouver Olympic Bid.

I just have a few announcements…first some acknowledgements. This is the first conference I've ever been involved in planning and to be honest, over the last few months there have been many time I have felt we were in a state of absolute chaos. But I'm very pleased that everything seems to be, from my perspective, unfolding very smoothly. And the credit goes largely to the people you see walking around with the headset: Joanie Pop and Kelly Carson with Event Dynamics, and helping them, Lynne Edwards. And also the AV team…they've been very good…Chase Productions, Ryan, Shawn, Zak, Andy, Andrew and Chris. And of course the hotel staff has been great, they've been helping us out a lot, this has been a great place to have a conference. So I'd just like to give a thank-you to all those people (leading the audience in applause).

Just a couple more quick ones…a request that you please fill out the comment form in your registration packet; that will help us improve the conference in the future. And also the schedule today is a little different…the daily concurrent sessions will be ending at three…they'll be a few things continuing such the Environmental Cooperation Council meeting. There's a couple of workshops listed in the program, but the other concurrent sessions will be ending. The idea was to give you some unstructured time and an opportunity to interact on your own so I hope you take advantage of that.

Thank you very much.

CLOSING SESSION
APRIL 3, 2003

David Fraser

OK. Thank you for joining us for this wrap-up session. We hope to get through this fairly quickly. Eric Karlsen and Joe Gaydos have spent the last four days listening to the discussions and presentations and have spent some quality time putting together a synopsis of what we've heard, and I've had a quick view of this and this is going to be fun. So. Joe, Eric?

Following this presentation we're going to have the student awards and then…we're off.

▶Eric Karlsen

Georgia Basin Ecosystem Intiative

Well good afternoon everybody, and I congratulate those of you who have the staying power to be here with us this afternoon. Joe and I were thinking about doing the "two Ronnies," and if there are any Americans in the audience and you know who the two Ronnies are, that's great, but…it's basically a British joke and I'll leave it at that. Leave you wondering.

One of the things that I just wanted to start off with is, that I'll ask you to write down the word "Earth" three times in a row with no space in between it. Come on, get your pens out, this is… an interactive…we've got to put you to work here. (A shout from the audience: "Got a pen?"). Got a pen? We didn't…oh my goodness. So anyway…when you write that word down without a space between it, you see a number of words in there. The first one you see is "ear," so you can listen, and just to make sure that you're listening. It also says that you can "hear." The next word you see in there is "heart," and I…reflecting back on…some of our keynote speakers who really did speak from the heart…Chief Billy Frank, Elizabeth Dowdeswell…and the others…Stephen Hume. "Hearth" is another word in there, our home, the Earth. And "art." Stephen Hume spoke about the poetry of it…of what we're here for. So it's really interesting when you take a word that we see as something really important to us…put it together like that, there's so much more in there.

The title of our topic is "Securing a Sustainable Region." It's not about just studying it; it's not about just planning it; it's about being really serious about securing it. And so that's the challenge that we're going to speak to this afternoon. And we're going to speak to it from the point of view of initially saying thanks. This has been an absolutely tremendous experience for all of us and…as Joe and I have had the benefit of receiving…well all of us attending, but also…Joe and I have got the benefit of receiving the chair's notes on each of the sessions. The richness and the depth that's been reported in the abstracts, that's been reported in the sessions outlined, has been deepened by… that response and we'll be getting back to you on that response in the weeks ahead.

But we want to say thanks to the hosts and sponsors, to the keynote speakers, to the political leaders. I…you know I've been around politicians for a long time and the quality of their speeches that we got this week were just outstanding. They were in depth and thoughtful and we're just demonstrating real leadership. And I make that as a non-partisan comment and I'm not a bureaucrat anymore and I would still make it as a bureaucrat in the past. The session chairs and the presenters…what an incredible gift that you've given to each other…to the people of this region! And thanks to those who supported everyone's efforts; just a huge effort gone into preparing for and bringing this conference to…to the quality that it has. And there are so many people whose names aren't on documents, whose names aren't…aren't known to us…they've…just done so much so we just wanted to start by saying thanks.

When you look at this region in daylight from so far above, we really don't see the footprint…our human footprint. It looks pretty green. iIt looks pretty healthy. And yet when we reflect on what Stephen Hume told us, there is a problem here, there is a footprint. He spoke about a string of lights draping the shoreline of the Sound and of the Straits. He expressed it in terms of abundance and prosperity for some and degradation and loss for others, and it's that degradation and loss that…needs our attention and that you've been giving attention to. And so, how are we approaching this? Well we're…we've approached this in terms of looking across the boundary; we've approached it as Elizabeth Dowdeswell

has called on us to approach it. She spoke about a philosopher…whose name is slipping my mind…is it George… anyway…about a philosopher who said that the action is at the boundaries, it's between the disciplines, it's between the jurisdictions, it's among the…it's going across those boundaries that energizes us, it's where the action is. It's, in effect, stepping outside of the box and working together.

And when we reflect on this, what boundaries are we working with? Well, we're working with the ecosystem's boundaries, and this map (referring to the screen) represents some of the ecosystems that…at a fairly large scale…that occur in the region…in this bio region. And it's that starting point that we have to look at and that we've been looking at to build the sustainability that is so important to this region.

The Georgia Basin Region is rich and diverse in its ecology, its landscape and its peoples, rich and diverse. Really there's no other place like it in its richness and it's diversity of landscape, of people. And for the biologists among you, and I'm not a biologist, I hear that diversity is strength. And we have huge strength here…and we have an incredibly diverse population; two countries, many towns and villages, bringing with…bringing with them an ethos, a sense of place, and with that, an environmental ethic, a social ethic and an economic ethic, but mainly a stewardship ethic that is going to drive our…continued efforts in the future.

And why do we need to do this? Well, there are seven million people living here now and there will be another three to five million by 2020. That's huge, because this map, this air photo (referring to the screen) shows that there really isn't a lot of landscape left. From geological events we didn't get a lot of flat land or gently rolling land. We've got a highly incised landscape, a highly…complex landscape…flooding, natural hazards, …the complexity is huge. And we're still beginning to find ways of accommodating people, of restoring the environment as well.

So here's the challenge: how can we sustain, albeit restore, the integrity of the ecosystem and achieve a social and economic vitality of the region's communities? That's what sustainability is about, it's sustaining…and that means restoring, to the proper functioning conditions, the integrity of the ecosystem. It's about achieving social and economic well being and maintaining that…and it's about community. Over 800 people have attended…I think the number was 840 including the media…that's huge, that's fabulous! Three hundred presentations were made…the notes that we got from you are about an inch and a quarter thick. I'm still on inches for those of you who run in metric…sorry…300 presentations. One of the things that really fascinated me was that there were several conferences within the conference, there were different tracks, different streams of conference…and Joe will speak a little bit more about that. There's a great diversity of disciplines, perspectives and interests; there's very little that wasn't represented here. But there were… .as we look to the future there are opportunities to enhance the participation from the business and social sectors. But coming out of a science-based research orientation and building on that… to the future, we can see opportunities for that to happen. I will speak more about that in a few minutes.

People are working across boundaries in all senses; they're building on research…transferring knowledge to decision-makers; there is progress towards sustainability. We're talking about the glass being half full, we're talking about hope, and we're talking about progress towards sustainability. We recognize there are challenges, Joe will speak to those, but we feel and know really strongly that there is a demonstrated commitment to meeting these challenges. The Chief spoke about the lifelong commitments…he was speaking to the converted when he spoke of these lifelong commitments. We have people in this room who have dedicated their lives … to their science, to their environmental interests and we have young people who have dedicated the energy of their youth, their enthusiasm, to getting on with the fundamental big step in a career to sustain the ecosystems, not only in this region but probably around the world. It's huge.

There was a lot of discussion about sense of place; a growing shared sense of this place. It's essential, because what we're talking about, is place-based decision making, we're talking about making this place what it is, what it could be. We're excited and passionate about it; it's part of our identity; we share hope, commitment and energy. And because we identify with this place, because we have this hope, because we have this commitment and this energy and a job to do, we're going to take responsibility for it. Everybody that has participated in this conference has demonstrated a choice to take responsibility for the well-being of the future of this region. We are getting more and more and we are merging more and more traditional and scientific knowledge about this place. We know what it was like in the past now. We had some very interesting…presentations on…past, pre-contact uses of this place. Unfortunately, we know how we've changed it and fortunately we know how we've changed it, because by knowing how we've changed it and knowing what it was like before, we have a blueprint. We know how this is affecting our quality of life and we know how it's going to affect our quality of life in the future. We know what we need to do to ensure our well-being…all of the papers brought this to us.

I want to make special note of the Coast Salish presentations here. I talked to one of the representatives from the Coast Salish group and I asked how many presentations were made by the Coast Salish people? There were 20 of them; these ranged in looking at bioaccumulations of (inaudible) fish and shellfish by the Swinomish, to overall planning for conservation in Indian Arm by the Tsleil-Waututh, and to the use of traditional knowledge by the Tulalip. What this did was enable Coast Salish peoples to build their own capacity in making these presentations. They also enrichened our knowledge of the past and gave us visions for the future. It's a…tremendous accomplishment of this conference, for the Coast Salish and for the rest of us.

So where are we going? We know that current development patterns are not sustainable; we know that not deciding to change is a decision to continue with the *status quo* to degrade the well-being of the region. And we know that science and knowledge must be delivered to the local level in usable forms to make a difference. Ken Cameron of the Greater Vancouver Regional District, a longtime colleague of mine, … in the…. regional planning wars in this region and… other places, presented the old paradigm: Science Served Senior Government Research and Decision Making. And as Mike Harcourt pointed out in the panel that he joined us on, it also served to get him criminally prosecuted as the Mayor of Vancouver for some violation of the…of some … federal law, and he kind of was a bit shocked. He's a lawyer and… many years ago…and he was kind of shocked because he didn't know what he had done; why was he a criminal? It kind of didn't make for good intergovernmental relations; local governments were the regulated entities. And yet, as we've learned, that if they're not on the ground making the decisions in a sustainable way…it isn't going to happen…and the regulation…the regulatory system wasn't working. Science was ad hoc and not consistent over time, there was a focus on arbitrary standards, limited consideration of local conditions.

OK. We have a new paradigm now and it's… throughout the basin. The local government stewardship, partnerships with federal, state, provincial and First Nations and tribes and with communities, non-government organizations. We're focused on the development of a body of knowledge, not data, knowledge. We're focused on relevant local issues; we're looking at local management plans to be developed because those are what hit the ground, those are what hit the water, those are what hit the air. And we're proceeding with an application of risk assessment in the context of broad priorities. We are learning as we go.

So we see movement, big movement. We have moved from data, the wrong numbers, to information synthesis, to understanding, to knowledge for decision-making. This has been hastened by our transboundary and our trans-disciplinary dialogue. You know, being able to share across this boundary has been fantastic. I have been at it for just 10 years, but others much longer and others just beginning. But this… the energy of sharing across the boundaries, is just outstanding, and I hope that this can continue to serve us, and now I am going to turn it over to Joe, whose going to get really focused here. I am much more philosophical about these things, and Joe is going to give you the meat of it, the meat of this presentation. Joe, over to you.

▶Joe Gaydos

The SeaDoc Society
(Formely the U.C. Davis Marine Ecosystem Health Program)

Thank you, Eric. Three hundred presentations he talked about. Three hundred great presentations and I would have to say—student presentations—about 40 of them were some of the best. And people really stayed engaged and I will have to say 300 presentations are hard to collate into a 15-minute talk. And I think sometimes during the conference there were people who dedicated lifetimes that did get overwhelmed, and oh! Sorry Eric I was trying to keep that anonymous, but it was overwhelming at times, and I think all of us probably felt that.

And when we looked at all the topics covered, we kind of broke them down into three different groups. There were a lot of presentations on resources, individual resources, and systems and how they function. What we know and what we don't know. There were talks about threats to those resources, threats that we have known for a long time, ones that were mitigating, ones that we have no idea what we need to do right now. And then we talked about solutions. As we go through these, the resources varied from very, very small to very, very large, and as our knowledge varied from almost nothing to knowing individual names of southern resident killer whales, that allows us to document how PCBs move through the population from mothers, offloading and to their young, but there are a lot of species out there that we don't know about. You laugh at Sasquatch, but there are species, even species that we see everyday, sea ducks that are in decline, and we are missing basic information about their natural history and biology that is preventing us from developing recovery programs.

We also talked about the systems; we talked about ecosystem-level approaches and we learned that for 8,000 years, people have been here and they have been shaping the ecosystem and what we see today is a product of their influence and a product of our influence as well. And we are learning right now that every step that we take, everything that we do has outcomes. In the Pacific Northwest, as we have been reminded by Chief Billy Frank, by Steven Hume, by some of our other speakers, we really have a sense of place, and that sense of place is identified by the natural resources that exist in the area and the natural resources govern our economic stability. They govern our social well-being, and our quality of life. And many presenters really discussed, you know, how do we detail what is out there, how do we map it, how do we preserve it, how do we protect it? And those mapping efforts varied from the complex new technology of multi-beam bathymetry that allows us to look at the underwater of the sea floor at the resolution of 1 meter and has implications for how we assess habitat, basic oceanographic functions and how we conserve our resources.

We also heard talks by Coast Salish people who explained to us that their people have been living in this sustainable ecosystem for 8,000 years, and they have learned a lot and we have a lot to learn from what they have learned. We also heard talks from people, and one example is the Innu nation, we learned that there is a reason to have both traditional ecological knowledge and scientific knowledge, because when they are both played off each other they fill the gap. While we have been out there mapping and studying and inventorying and planning, we have also been hearing about the threats and some of those threats are small and some of those threats seem to be manageable. Little things that we can deal with and we can feel OK about and some of them, some of them like air quality, seem insurmountable at times.

About 800 people here and probably every single one of us got here at some point of our venture by automobile, and automobiles are the number one source of regional air pollution. We are working on that, we are working to improve public transit, we are working on internal combustion engines, and we are working to improve emissions and fuel efficiency. But at the same time we also learned during the conference that with everything that's going to happen within the next 15 years with improving fuel efficiency and emissions is going to be outdone by just the increase in diesel motor engines in the region.

Climate change, global climate change, is another one of those insurmountable challenges we face, and we learned that in 15 to 20 years the temperature in the region is expected to increase from 1 to 2.5 centigrade, I'm learning, and that's going to have impacts on us. It's going to decrease our annual snow pack by 70 percent, and you can imagine what's going to happen with water distribution and hydrology and all of the different steps that are going to influence. We are also going to see extremes and going to see greater floods and greater droughts. Climate change is happening and it's an area that we still need more information, to understand and to adapt.

Fifteen billion gallons a year of oil go in and out of the region and we heard about expert systems analysis, new technology, that will enable us when an oil spill occurs to look at the oil spill and to try and mitigate and to try and improve 5 to 15 percent of the spilled oil cleanup that historically happens with all oil spills.

I heard a lot about toxins this week. Toxins are still a major concern in the area. We learned that just from the toxic release inventory of Puget Sound area, and these are permitted sites of toxin release, there are over a million pounds of toxins released in the Puget Sound annually, and these are ones that are permitted, ones that we know about.

So when we look at the resources, and you think about the threats to these resources, if you are a good biologist, you will look hard and you will think they are telling us something. We need solutions to what's going on and we talked about solutions. Minister Murray told us that through the Advanced Products Stewardship, we are focusing on some of the most toxic substances and within the next year we will start recycling almost 18-million liters of oil a year; that's one tanker full of oil a year.

We also learned how citizen monitoring groups are helping us to collect data, that's good scientific data, quality controlled, quality assured. How it's involving people in the ecosystem and how it's educating them on what's going on and it's allowing them to make decisions in their house and decisions by individual action.

And this information science is transferred and translated into local decisions at all levels. Local, regional and international decisions and its helping us to plan and make decisions as we are integrating watershed information and landscape information and to low impact development.

But the reality is, things are moving ahead and the science and the people that use that science need to continue to move ahead. We talked about the region's population increase and what come along with that population increase are changes. It's our decision and our opportunity right now to realize that the changes and decisions that we make now are going to be the legacy of the future.

Chief Billy Frank reminded us that it's not about one conference or one research project. It's about a lifetime, a lifetime of staying on top of everything. So as far as the future needs, from what we've learned, we still need very basic research. People get very focused on applied research. A lot of times we don't know the things that we are going to learn out of very basic research and it provides us with technologies and answers that we don't know about until we can actually study that.

If you own a major production facility and you cut out research and development, you may be OK for the next 20 years, but then pretty soon you are going to be out of technologies that are going to allow you to deal with the new things that are coming along.

We also…it's equally as important…have needs for applied research. And there are a lot of different areas where we have needs for basic research and applied research and these include species in decline, toxins of all sorts, ecosystem levels of approaches to sustainable natural resources, air quality, climate change, the influence of diseases on populations and urban development.

And science, we need to translate that science, we need to translate it, so the people who use it to make decisions are able to use it. Whether those are citizens or whether those are government planners and it's critical as far as the future goes.

As we work through these sustainable practices, we need to demonstrate that they are really working and they really are sustainable. but to apply the amount of money that is available and the amount of manpower that is available is limited and so that then, comes to us. We have to remember Elizabeth Dowdeswell challenged us with that. Really, when we start looking at that we need to decide where is that money going to be spent. She gave us a good example that 90 percent of research dollars on health are spent on studying diseases that 10 percent of the world's population gets, and we need to keep that in mind when we make decisions about what research we are funding, what research we are conducting and how we are using that actual research.

So the resources that we have are critical to the economic well-being, the social well-being and our way of life, and we need to remember that our decisions are tomorrow's legacies. So it is science that brought us here today, and this week. But science by itself doesn't do the job—it just sits on the shelf. It may get you a couple of degrees. Really, we need to have that science, we need to translate that science, we need to utilize that science, and we need to integrate it into all the decisions that are being made now. So thank you all for coming, thank you for your time. (Applause)

David Fraser

Thanks guys. It was great. Our student evaluators are just wrapping up, and then we just need two or three or four minutes to finalize the tallying of all the votes. We have a couple of options for three or four minutes. I could do a song and dance, and you definitely don't want to see that, or we could just sit tight and it will literally just be a couple of minutes or if anyone wants to come up and make a comment, we are more than willing to hear anyone's views. Otherwise we can be a bit patient now. We will be right back.

We have Mr. Scott Redmond, who would like to say a few words.

Scott Redmond

Puget Sound Action Team

Thanks. Don't sit down Pete. One thing I want to do is to say a really hearty thank you to the guy who just introduced me, David Fraser, and Pete Dowty for coordinating this conference. I think they did a really nice job. (Applause)

About a year ago Patrick Higgins, who I think has gone home by now, helped make sure that this happened in Vancouver, and Bruce Kay who is sitting right next to Pete, (pointing) came down too. Well, we had some meetings and we made a commitment to come here this year. We have had five research conferences prior to this event. All down in the Puget Sound part of the Basin and this was a wonderful step to come here… and in drawing up my conference evaluation, I said, the best thing was hearing about the Canadian science. The investments that GBEI made over the past five years has been wonderful and so I really appreciate being able to come here and to hear about all of that.

Our intent is that this conference occurs again in the Puget Sound part of the basin in probably about two years and then two years after that we are back here again or back in Canada again. Peter Ross suggested, perhaps back in Victoria. I would like to see that happen. I would like to see some momentum gathered from here. We go back and do our work but retain our linkages and meet again in two years. Thanks very much. Really, thanks David and Pete, the advisory committee, the session chairs, everyone who was involved, Joanie Pop and her crew, the hotel crew, thanks very much. (Applause)

David Fraser

OK. It is really a great pleasure for me to introduce Dr. Jan Newton, who has done so much work in tallying these student evaluations and who has the honor of presenting the awards for the student's presentations and posters.

Dr. Jan Newton: Awards for Student Presentations and Posters

Washington State Department of Ecology

Thank you. Thank you David, and thanks to Pete and everybody who was involved in this. I'm out of breath, but I figured if you are sticking around, you will probably want to have a little bit of good humor, so I'm going to tell you that I'm going to start off by telling you a strange little secret about myself. Soon, not to be a secret. I really love award shows. Emmys, Oscars, Grammys, five hours long, I don't care. I love them. I watch them. I just think they are fun and I don't know why. When other people complain I just…… so anyway it's kind of fun to be up here…. and I think our profession doesn't have an Oscar or an Emmy and I think… that's probably a really good thing …for several reasons. Scientists are not known to have much of fashion sense… or humor… but what we do have is, a really good tradition, of nurturing our newest members of our profession along, and that's what… in this meeting… we have upheld this tradition and it's a really fun thing to be involved in. There is a lot of gratification.

We had over 20 judges who participated. We had 135 match-ups of judges with a student and these people really deserve our thanks. So thanks, to all our judges. (Applause) But you know… actually after we've thanked them… you know… sometimes they are pretty smart, they are a little self-serving. A lot of them told me, " Hey! It was really fun. I really enjoyed this" and some of them said, "You know I am so glad that I get assigned to the student talks because I know they are going to be good talks" ….. And it's true. I think we saw an awful lot of good student presentations. So, let's get on with this..

OK. We have three categories and as imperfect as any evaluation survey is, you know its difficult to say who is best, but every student was evaluated at least three or four times with a form with numerical scores on it and the students will get back these forms and that's the most important thing. Because they actually get a written as well as numerical feedback from different mentors, and so I am going to announce the winners, but also the other folks, so they can come up and get their evaluations and if you're not here, you're not listening but we'll mail them to you, don't worry…

Alright, so we had three categories. We differentiated undergraduate students from graduate students and… in the

undergraduate category we have one award. In the graduate category, because there were so many, and because there was different media, we differentiated posters from oral presentations.

And so without further ado, I am going to present for a graduate poster: The third place person is Jason Sandahl from Oregon State University. Jason, here? (Applause)

OK. Second place went to Jenny Christensen from U.B.C. (applause)

OK. They are smarter than we are, and the winner and the recipient of a $200 Canadian gift certificate to Mountain Equipment Coop goes to Lucy Weis from the University of Washington (applause) … and the other people who are here, and you know some of these scores were very close, so I'm going to read the other names so you can hear who is involved:

Amanda Babson, Donna Ball, Debbie Erenstone, and I apologize if I'm messing up your name: Jennifer Hernandez, Sarbjeet Mann, Lauren Mark, Sacha Maxwell, and … Jay Scibek… OK. So that's the graduate posters for all of them. (Applause)

Alright, drum roll here, for the best graduate oral award … oops…. got to start with third place, got to keep you in suspense, right …. Well third place is interesting, we had a tie, and I forgot to mention that for all the runners up, we are going to give them this very beautiful poster …. I know I am stumping …. I am really that low …. but it is beautiful artwork by Marvin Oliver, a native American artist, resident at the University of Washington and this is one of the few uncreased editions around…OK, so the tie for third place goes to Katherine Sobocinski, of the University of Washington and Chih-Fan Tsao of ….somewhere here…University of Washington. Thank you. (Applause) Come on up. Hey, we've got a live one….Congratulations! … Smile for them…OK. Chin-Fan is gone OK. Second place graduate oral presentation goes to Cristen Don (applause) Cristen, where are you from?

Cristen Don: University of Washington.

Jan Newton: Congratulations. Oh, wait, Cristen, your poster…you're welcome.
Alright…yes, and the first place graduate oral presentation will get a $200 Canadian check, goes to Christy Morrissey of Simon Fraser University (applause) Congratulations!….

Christy Morrissey: Thank you very much, and a poster too, thank you.

Jan Newton: Congratulations … you're very welcome (applause) OK. and the other people in this category were: Elsa Carlisle, Dan Cooper, Donna Cullon, Sarah Dudas, Lea Elliot, Aleta Erickson, Sean LeRoy, Linda Lyshall, Julie Matweyou, Scot MacKillop, Fiona McNair, Brent Mueller, John Ryder, Dana Seaman, and Nathaniel Trumbull, for all of them (applause).

OK. So I saved my favorite for the last, the undergraduates and so for third place undergraduate oral presentation goes to Ben Starkhouse of the University of Washington (applause) alright. They really are gone, not just shy,...right? OK. Second place undergraduate oral presentation… goes to Jackie Amsden, is she here? (Applause).

Alright and so to give the award for the first place…undergraduate presentation, Brett Dumbald … are you in the audience? Please come on up here. This award is being awarded by the Pacific Estuarine Research Society. It's a gift certificate to the University of Washington bookstore for $150 U.S… and because Brett's eyes are better than mine he gets to read the winner.

Brett Dumbauld: Cool ...so it's the first name here?

Jan Newton: No, it's all of them.

Dumbauld: But they are all abbreviated. I don't know their first name."

Newton: Read the last names.

Dumbauld: (Reading) A.[Ashley] Adams, H. [Heather] Anderson.

Newton: Use the microphone Brett.

Dumbauld: You guys can hear me…come on. E. [Emily] Augenstein, I. [Ian] Bell, L. [Lisa] Cooper, J. [Justin] Hellier and M. [Mara] Wrede.

Newton: This was a group of undergraduate students who had a poster together. They did a poster on Backyard Benefits. Are you here? Yay! (Applause) .

Dumbauld: Alright! (applause)

Newton: You get to present that. OK.

Dumbauld: And give them a picture or something?

Newton: Yes.

Recipient: "Thank you sir,

Dumbauld: You're welcome. We have to stand here…hold it. (Picture being taken) (Applause)

Newton: OK. Also undergraduates that presented: Noel Gray, Noah Halvorsen, Carmen Hranac, Johnathan Kellogg, Tony Litke, Michelle Newman, Kelly O'Neil, Wynnae Osenga…to all of them. (Applause) And last but not least, I have to thank Katherine Cox and Lynn Schneider who have been behind the scenes doing all the bookkeeping because I would have surely messed it up….and so I thank them for their help (applause) pointing …stand…(applause). OK, and then I turn it over to Pete.

Pete Dowty

That pretty much concludes the program for this conference. For those of you who are staying for the Pacific Estuarine Research Society Meeting, I hope you have a great meeting. For the rest of you, thank you very much for coming and joining us for the conference and hope to see you at the next one. Thank you very much. We are closed. Thank you. (Applause)